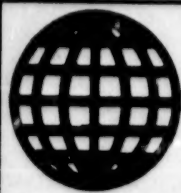


JPRS-TND-90-012
18 JULY 1990



**FOREIGN
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JPRS Report

Nuclear Developments

Nuclear Developments

JPRS-TND-90-012

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18 July 1990

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SOUTH AFRICA

Potential Site for New Nuclear Plant Discussed

51000012A Mbabane THE TIMES OF SWAZILAND
in English 14 Jun 90 p 12

[Text] Cape Town—ESKOM [Electricity Supply Commission] has identified a potential site for a nuclear power station after a 10-year investigation costing R6 million.

The new site is at Bantamsklip, about 30 km from Gansbaai on the Cape South Coast.

At a news conference in Cape Town on Tuesday ESCOM [as published] executives emphasised the corporation was looking for sites for potential development.

A nuclear power station would not come into operation before the year 2005, they said.

Their investigations covered a broad range of disciplines, including socio-economic and ecological factors, seismicity, geology, engineering and demographics.

NORTH KOREA

Nuclear Weapons Research, Development Examined

902C0182A Seoul WOLGAN CHOSON in Korean
No 4, Apr 90 pp 220-255

[Article by Cho Kap-che: "The Nuclear Game on the Korean Peninsula—North Korea's Atom Bomb Development and South Korea's Counter-Strategy"]

[Excerpts]

North To Succeed in Atomic Bomb Development

In the judgment of most of the dozens of nuclear scientists and engineers whom this reporter has met to collect materials for this report, the purpose of the research nuclear reactor which is in operation in Yongbyon, North Korea, is to produce plutonium for use in the manufacture of nuclear bombs. A U.S. Government agency has asserted that the rectangular building next to the reactor is a reprocessing plant to separate plutonium formed in the research reactor. These Korean scientists also are in agreement with this judgment on the part of the U.S. scientists. Among the scientists sharing this view are those who participated in President Pak Chong-hui's secret nuclear weapons development project in the 1970's and who are familiar with the formula of atom bomb development in developing nations.

Korean scientists and military experts are generally of the opinion that North Korea will succeed in atomic bomb development and that it would be difficult for the United States and the Soviet Union to pressure North Korea to suspend this development. According to these scientists and experts, there is not much these superpowers can do about this development because North Korea is operating the research reactor and the reprocessing plant by its own nuclear technology which it has accumulated single-handedly since the 1950's.

North Korea sent engineers to the Soviet Union in the 1950's and 1960's and to Pakistan, which was secretly developing atomic bombs, in the 1980's to learn nuclear technology. Subsequently, it quietly engaged in some kind of secret project by securing a large group of research workers estimated at approximately 2,500 in number.

A tangible outcome of this project was the research reactor the construction of which was undertaken in 1980 and completed in 1987 with its own technology. North Korea upgraded the capacity of the 1,000-kilowatt research reactor to 2,000 kw and again remodeled it to further upgrade the capacity to 4,000 kw. Through this remodeling process, North Korea learned reactor designing technology, and on this basis, it built a full-scale research reactor of its own. After accumulating its own technology step by step in this way, North Korea is now venturing to develop atomic bombs. Accordingly, its potential cannot be ignored.

Since it has been established that this reactor with a 30,000-kw capacity is of the classic type which converts domestically available natural uranium into plutonium by using graphite as a moderator, the United States has sent warning signals to North Korea through the Soviet Union.

Nuclear scientists say: "Atomic bomb manufacturing technology is not something that is difficult to master. As a matter of fact, reprocessing technology is far simpler than running an oil refinery. The research reactor which North Korea has built according to its own blueprint is something more difficult to build than a facility to produce an atomic bomb. Atomic bomb manufacturing is not so much a matter of technology as a matter of determination." It is not because the ROK and Japan lack technology that they do not manufacture atomic bombs. It is rather because they are under international inspection and, what is more, they do not see any need for it. This is to say that when there is a political leader who has such strong will power that he is ready to brook international pressures and criticisms resulting from atomic bomb manufacture, he is bound to produce an atom bomb.

System Suited to Secret Development

Han Pil-su, director of the Atomic Energy Research Institute, said that "If North Korea accepts International Atomic Energy Agency (IAEA) inspection, it will receive many benefits, such as the introduction of nuclear energy technology for peaceful use; but I wonder why North Korea is continuing its secret project while subjecting itself to various disadvantages." According to the analytical view of another nuclear scientist, "North Korea's nuclear development system is one under which North Korea independently operates a nuclear fuel cycle of natural uranium produced in North Korea—the research reactor—the reprocessing plant, without relying on foreign countries." In such a case, there is no way for any foreign country to intervene, and diplomatic pressures will be of no avail. The same scientist said, "The Soviet Union is to build a commercial reactor in North Korea, and when this takes place, the Soviet Union will be in a position to exercise influence." Our nuclear scientists are of the opinion that the North Korean social system is most suited to the manufacture of atomic bombs."

They say: "The greatest technological difficulty in dealing with plutonium is safety. How to dispose of radioactive wastes and how to handle strongly radioactive spent nuclear fuel is the focus of reprocessing technology, but in North Korean society, they do not have to be concerned about these safety aspects. They need to import a shielding installation and intricate remote control devices in order to build a reprocessing plant on their own. Even so, all they have to do is to develop these installation and devices themselves by making a huge amount of investment without regard to efficiency. What is more, this will suit their purpose to a T because they are assured of secrecy, into the bargain."

That atom bomb manufacturing technology has nothing to do with the average standard of living in a particular country is quite evident from the fact that even poor India and China with no nuclear power plants have become nuclear powers. North Korea, in particular, is a military power which has sacrificed the living standard of its people for armament. According to a military strategy expert, North Korea must have thrown the nuclear energy-related technical personnel who have been nurtured these 30 years or more into research work aimed at producing atomic bombs, and the time has come at last to reap the fruit.

This expert who holds a key post in our government said: "It is expected that North Korea will possess an atomic bomb in 1993. The information in our hands indicates that the North Korean research reactor has the capacity of producing an amount of plutonium sufficient to manufacture one or two 20-kiloton atomic bombs equivalent to the one dropped over Hiroshima. Other countermeasures, in addition to diplomatic pressures, are under study. If North Korea refuses to suspend nuclear development, public opinion will come to demand that we, too, develop atomic bombs in response."

The prevailing view is that if the development of an atomic bomb by North Korea becomes a reality at a time when it is engulfed by the gale of democratic movement in the communist bloc, and when Kim Chong-il is ready to succeed to power, the military balance on the Korean peninsula will be radically destroyed and security based on this balance will also become shaky. The current military balance is based on this equation: North Korea's overwhelming conventional military power = the inferior ROK conventional military power + the nuclear weapons of the U.S. forces in the ROK. North Korea has already begun to use its nuclear bomb development as a political weapon by demanding the withdrawal of U.S. nuclear weapons in South Korea in return for accepting international inspection of its nuclear facilities.

Nuclear Engineer Kyong Won-ha Invited From United States

There is a basic difference between reaction to reports about North Korea's nuclear development and that to North Korea's Mt Kumgang Dam construction. With respect to reports about the waterworks project of the Mt Kumgang Dam, the United States was skeptical while South Korea was certain. On the contrary, with regard to reports on North Korea's nuclear development, the United States is more certain, and South Korean nuclear experts go along with the U.S. view.

In 1981, a U.S. intelligence group briefed high-ranking ROK authorities on the fact that "the research reactor North Korea has started building in Yongbyon is aimed at manufacturing nuclear weapons." Last summer this same intelligence group reported to concerned South Korean officials that "North Korea seems to have completed a reprocessing plant in addition to the research reactor, and that North Korea is expected to turn out a

nuclear weapon in 1990." In addition to the research reactor and the reprocessing plant, the Yongbyon nuclear center has a trigger testing ground on the white sandy river bank. Rumor says that a U.S. spy satellite captured a trigger testing scene.

Some nuclear scientists recently analyzed the pictures of the Yongbyon nuclear facilities taken by a French satellite, and came to the conclusion that the North Korean research reactor is not, contrary to the original speculation, the gas-cooling type using natural uranium as fuel and graphite as a moderator, but is the heavy water-cooling type using uranium as fuel and graphite as a moderator. In their opinion, the reactor is too small to be of the gas-cooling type. Canada's NRX is a common type of heavy water-cooling system. The annual plutonium generating capacity of North Korea's 30,000-kw research reactor is 8 kilograms, equivalent to the amount needed to produce a 20-kiloton atomic bomb. (The specific gravity of plutonium is about 19, and the mass of 8 kg of plutonium is as large as a baseball.) Some estimate the plutonium separation and extraction capacity of the Yongbyon reprocessing plant at 6 kg per year.

In connection with the report that the research reactor is of the Canadian type, a concerned ROK agency turned its attention to Kyong Won-ha, former nuclear engineer in the United States. He took part in the manufacture of nuclear bombs at Los Alamos National Scientific Laboratory in New Mexico, and later while serving as professor at McGill University in Canada, he reportedly entered North Korea. Kyong is said to have entered North Korea with a large quantity of technological data, including data concerning the research reactor developed by Canada, adding spurs to nuclear development in North Korea.

ROK nuclear scientists also have a high appraisal of Yi Sung-ki, director of the Yongbyon Nuclear Energy Research Center. Dr Yi—the dean of the School of Engineering, Seoul National University, before the Korean war broke out—majored in fiber engineering in Kyoto University, and he is well known worldwide as a chemist who invented vinylon after choosing to live in North Korea.

Kim Il-song trusts Yi so much that when Kim visited the Yongbyon research center, he stayed with Yi in the same room. Chong Kun, a 1942 graduate of the Department of Physics of the Keijo Imperial University [predecessor of Seoul National University] in 1942, is also marked as a key figure in the atom bomb development project. Generally speaking, North Korea is strong in the area of chemistry. Chemical processes such as reprocessing and the operation of research reactor being the key to atom bomb manufacture, North Korea has a sound foundation for such manufacture.

Another reason that North Korea can develop an atomic bomb without any technical help from a foreign country is that it has uranium deposits.

The concentration rate of uranium ores abundant in South Korea is so low that it is not fit as fuel for research reactors, but the concentration rate of uranium ores available in North Korea is between 0.5 and 0.8 percent and can be used in the research reactor after going through the refining process.

A scientist who was a key participant in the nuclear development project in the days of President Pak Chong-hui said, "in those days there was a lot of confusion surrounding our nuclear development plan; but inasmuch as there is consistency in the direction of development in North Korea and there is a solid foundation, North Korea is ahead of us compared with the level of our technology in the 1970's."

Last Means of Deterrence

[passage omitted] One of our government officials made this significant remark: "North Korea is developing means of delivering nuclear bombs. By remodeling Scud-B missiles introduced from the Soviet Union, North Korea is conducting tests designed to extend their range to 500 kilometers. We will ask the Soviet Union to stop North Korea from manufacturing nuclear bombs. I think when we take action, we will need understanding on the part of the United States and the Soviet Union."

A concerned government official said that North Korea seems to have a psychological as well as an economic purpose. "According to him, North Korea has set it as an immediate goal to succeed in nuclear testing, rather than build a full-fledged nuclear force, and after developing one or two nuclear bombs, it will try to reduce its conventional force and pare down its military outlays. For North Korea to become the world's seventh nuclear power will give a great deal of self-confidence to the North Korean inhabitants. The same official said, "the next two years is the problem. First, we will wait for the United States and the Soviet Union to hold North Korea in check. Bush is so concerned that he is asking Gorbachev to intercede. If the Soviet Union fails to check North Korea from developing nuclear weapons, it would become a stumbling block to U.S.-USSR disarmament talks."

To assess our capability to counter North Korea's atom bomb development, we should examine the nuclear development project in the period of President Pak. Some aspects of this project were overly exaggerated in the past. This reporter located the participants in this project and related top secret materials. [passage omitted]

Easy To Build Reprocessing Facility

Dr. John R. LaMarche [name as published] also pointed out that information necessary for designing [an atom bomb] is included in literature already made public, and parts and materials necessary for construction can be purchased on the open market. Uranium, plentiful everywhere in the world, is available at not too great a cost. He said that despite the international rules prohibiting the proliferation of nuclear weapons, it will be impossible to block these countries [small and developing countries] from pushing the development of nuclear bombs. He concluded by saying that "it will be

rather desirable to convince them logically that they have no need to develop nuclear weapons."

According to Dr. LaMarche, the minimum amount of plutonium necessary to make one nuclear bomb is four kg, and that of uranium necessary to make one enriched uranium nuclear bomb is 11 kg. The best type of research reactor that can be chosen by a country like North Korea which has no atomic power plant is a reactor which can use unprocessed natural uranium as fuel and which can use graphite as a moderator and gas as a coolant. This primitive type reactor is similar to the world's first reactor built in 1942 at the University of Chicago by Enrico Fermi, the pioneer of atom bomb manufacture.

The detailed blueprints of this type of early reactor have long been made public; accordingly, it is easy to build a reactor by copying them. According to Dr. LaMarche's calculation, one construction engineer, one electric engineer, two mechanics, one metallurgical engineer, and three nuclear engineers are all that is necessary to command and supervise the construction of such a reactor. He maintains that in four years following the commencement of the construction project, the reactor will be in operation, and that in another year, a sufficient amount of plutonium to make one small atom bomb will be generated in the spent nuclear fuel. North Korea built its research reactor, which resembles the one described in Dr. LaMarche's report so much that it gives the impression that North Korea had followed his formula exactly.

Dr. Kim Tong-kun, chief of the project group for the K-MRR (Korea multipurpose research reactor), which the Korea Atomic Energy Research Institute has been building since last year at a cost of 70 billion won, had this to say: "The North Korean research reactor is extremely simple. If only we had had a desire to build one similar to that, we would have built it a long time ago. Compared with our K-MRR in particular, the North Korean reactor is terrible as far as engineering is concerned. However, the problem is that our research reactor, built with advanced technology, is for peaceful use, whereas the North Korea reactor, which is very crude in quality, is suitable for the production of plutonium."

Dr. LaMarche also submitted a research report on the nuclear fuel reprocessing capabilities of developing countries. His findings from this research were similar to those on the reactors for the production of plutonium. By using published literature and parts available in the open market, developing countries can easily build reprocessing plants and operate them.

To extract weapons-grade plutonium by the reprocessing method, the fuel which has been burnt for about a year in a research reactor must be removed from the reactor and put in a reprocessing plant.

The natural uranium used in a 25,000-kw research reactor is about 60 tons, from which about nine kg of plutonium is generated. The spent nuclear fuel taken out of the reactor is stored in water for about 120 days to reduce its radioactivity. In the case of the spent nuclear fuel removed from the research reactor used for the

production of plutonium, its radioactivity is reduced to about 55,000 curries per ton in 120 days. This is about 1/50 of 2 to 3 million curries per ton for the spent nuclear fuel removed from a commercial nuclear power plant.

The greatest technical problem involving reprocessing is how to move, break up, cut, analyze, dissolve, and separate the highly radioactive spent nuclear fuel by remote control after containing it in a shield. The construction, installation, and operation of the shield to seal off radioactivity and the remote control devices used in this process are the heart of the reprocessing process. This is to say that it is much easier to build and operate a research reprocessing facility for the extraction of weapons-grade plutonium, which handles much lower doses of radioactivity than commercial nuclear fuel reprocessing facilities.

There are a lot of blueprints for plutonium reprocessing plants which have been made public. According to Dr. LaMarche, the blueprint of the Barnwell reprocessing plant in South Carolina is available at libraries or can be purchased. He said that there is no need for highly trained personnel in designing, building, and supervising a reprocessing plant, and that these seven engineers would be sufficient: two chemical engineers, one construction engineer, one electric engineer, one mechanical engineer, one metallurgical engineer, and one nuclear engineer. According to his calculations, \$25 million will be needed to build a reprocessing plant for plutonium extraction in the United States. [passage omitted]

Nuclear Issue Needs Public Discussion

As the saying goes, "for the sake of peace, we have to be prepared for war." In order to prevent war clouds from hanging over us by not permitting North Korea to develop an atom bomb and break the military balance on the Korean peninsula, the ROK will have no choice but to secure means necessary for the manufacture of atom bombs on the premise that it will not go so far as to actually manufacture them.

Any atom bomb in the hands of Kim Il-song and his son, who ordered the 21 January raid on the presidential mansion, the Aungmye bomb explosion (in Burma), and the blasting of KAL 858, is different from any other atom bomb in the world.

The man who stands near an adversary armed with a knife does not have to take up a club first, but he should have a club ready within his arm's reach.

In this case, the club means a reprocessing plant. Possessing a reprocessing plant is an important issue of national security strategy in two respects, namely, from the point of view of attaining self-support in atomic energy and from that of securing atom bomb manufacturing potential.

If this issue is left to bureaucrats or scholars, they will conduct research into reprocessing technology in such a

manner as if they were stealing something, always trying to see how the United States feels about it.

Without exception, the concerned government officials or scientists the reporter met demanded that politicians, diplomats, and journalists come out to make a public issue of this important matter. The issue of a reprocessing plant is not a simple question of whether or not to build just another factory.

In the event North Korea comes into possession of nuclear bombs, what will be the option of the ROK? One option will be to ask the United States to retain its nuclear weapons in Korea, but this would increase ROK subordination to the United States and further enhance U.S. influence on the situation on the Korean peninsula.

If South Korea is to secure a nuclear development capability as a countermeasure, it should call the United States to account for its failure to prevent North Korea's nuclear development, before proceeding to build a reprocessing plant for peaceful purposes.

Kim Chong-il is clever and has quite an artistic propensity into the bargain. He is such a movie buff that he engineered the kidnapping of Sin Sang-ok and Choe Un-hui. The film library in Pyongyang built by him is said to be the world's largest in scale. Director Sin said that in this library he saw the films of his own movies which cannot be found in South Korea.

Proof is turning up piece by piece indicating that Kim Chong-il, whose artistic obsession is so intense that he seeks to attain his objective by sacrificing everything once he sets his mind, is now pouring his passion into the development of a nuclear bomb.

It is in the military field in which North Korea, which trails South Korea in the diplomatic, economic, and ideological fields, is trying to hold an edge over South Korea to the end. A nuclear bomb may be a reliable security for North Korea, which is in crisis, and for Kim Chong-il, who is in the period of power transfer.

Making North Korea Realize Its Fallacy

Inasmuch as the nuclear bomb is a vital issue, it cannot be glossed over, for either side of North and South Korea. As is evident from Israel's attitude, when a state feels its right of survival is in danger, it will instinctively take action in self-defense.

Inasmuch as Kim Il-song and his son have a strong obsession for nuclear development, South Korea's determination to block North Korea's nuclear development will grow stronger.

After the nuclear testing in 1974, India did not go so far as to manufacture nuclear bombs. Pakistan, too, although it has secured all necessary materials for nuclear bombs, is reportedly not proceeding to assemble them. Israel, although it possesses dozens of atom bombs, has made no formal admission of this fact and is rather engaged in psychological warfare by leaking the

fact of possession to the press to scare the Arab countries. Some observers expect that North Korea will stop at succeeding in nuclear tests and then do its utmost to use this success as a political weapon. But it will anyway touch off a nuclear game on the Korean peninsula. The most desirable solution will be for South Korea to declare its intention to develop nuclear reprocessing technology for peaceful use on the basis of its powerful system of nuclear energy technology and make North Korea realize that its nuclear development will only court a far powerful counter-development on the part of South Korea, thereby inducing North Korea to abandon nuclear development voluntarily.

SOUTH KOREA

North's Nuclear Capability Assessed; Options Viewed

Weapons Development Noted

SK2406121690 Seoul SEOUL SINMUN in Korean
19 Jun 90 p 5

[Article by reporter Yi Chang-sun: "Shocks and Ripple Effects of 'Speculation on the North's Manufacturing of Nuclear Weapons in Six Months'"]

[Text] Is speculation on North Korea's nuclear development turning into a reality?

The foreign news report that says North Korea will possess nuclear weapons in six months shows that speculation on North Korea's development and manufacturing of nuclear weapons—speculation that has stirred a great deal of controversy but has remained just speculation—may possibly become a reality.

It is very likely that North Korea's development of nuclear weapons will not only aggravate tension on the Korean peninsula, the last showcase of the cold war, but also significantly threaten the overall military balance in Northeast Asia and the world in general.

Speculation on the possibility of North Korea's nuclear development did not just start yesterday. This speculation has persistently continued for several years. In addition to the nuclear power station that North Korea has been building in Yongbyon, U.S. satellite photos have shown facilities there that appear to be nuclear test sites and a nuclear fuel reprocessing plant.

Nevertheless, experts in the United States and Western countries have so far been skeptical about North Korea's capability of manufacturing nuclear weapons. Last April, Wolfowitz, U.S. under secretary of defense, expressed doubts concerning the North's capability, saying that it is far from having the technology to develop nuclear weapons.

The United States has thought that even if North Korea may choose to manufacture nuclear weapons with Chinese assistance, it will take at least five years for it to

manufacture nuclear weapons and that it cannot manufacture nuclear weapons using its own technology because the Soviet Union has thoroughly controlled nuclear proliferation. The Soviet Union recently suspended the sale of four nuclear reactors and pertinent technology and materials to North Korea.

It has been generally agreed that North Korea's current technological level with regard to its nuclear capability is insufficient for it to manufacture nuclear weapons and that, merely because it may possibly manufacture nuclear weapons, it must be subjected to international scrutiny.

In particular, even North Korea itself recently hinted that it may sign the nuclear safeguards agreement with the International Atomic Energy Agency [IAEA]. On 14 June, Chong Kun-mo, minister of science and technology, who had attended a meeting of the IAEA Executive Committee, said that North Korea had notified the IAEA that it would send a delegation to the IAEA in July to discuss the issue of signing the nuclear safeguards agreement and that this notification was a meaningful "step forward" toward its signing of the agreement.

Under these circumstances, the foreign news report that North Korea will possess nuclear weapons in six months is shocking because it has fundamentally reversed the "established theory" on North Korea's capability for nuclear development. This report pointed out that North Korea can possess nuclear weapons in six months, not in five to six years, and that it acquired technology and materials necessary for manufacturing nuclear weapons from the previous regimes of East Germany and Romania, neither of which the Soviet Union had been able to control. This is a matter of grave concern.

Of course, we think that, because the Soviet official who leaked this story did not present evidence, this story is still speculative. However, the very fact that it is a Soviet official who leaked the story on North Korea's possible manufacture of nuclear weapons is noteworthy. Some people say that it is unexplainable why the Soviet Union, which had kept silent over North Korea's nuclear development, suddenly disclosed this information. Some other people say that this is a strategy to apply international pressure on North Korea to get it to sign the nuclear safeguards agreement.

However, it is a well-known fact that North Korea has done its utmost to develop nuclear weapons in an effort to acquire military superiority over South Korea. We think that, especially since Gorbachev's new thinking led to reforms in Eastern Europe and global reconciliation, Kim Il-song has felt it all the more necessary to possess nuclear weapons to counter the Soviet Union's pressure to open up. Kim Il-song may believe that if he possesses nuclear weapons he will be able to free himself from the Soviet Union's one-sided control or influence, at least to a certain extent.

Therefore, it is very likely for North Korea to further hasten its nuclear development, and some experts say

that, irrespective of whether North Korea signs the nuclear safeguards agreement, it is already too late to brake its development of nuclear weapons. North Korea's efforts for nuclear development run counter to the era of East-West reconciliation. Moreover, they could likely turn the Korean peninsula, where signs of detente have resulted from the recent Korean-Soviet summit, into an area where a grave nuclear danger exists.

Defense Minister: DPRK Weapons 'Likely'

SK2206124590 Seoul YONHAP in English 1239 GMT
22 Jun 90

[Excerpts] Seoul, June 22 (OANA-YONHAP)—North Korea may be able to produce nuclear weapons in mid-1990s, South Korean Defense Minister Yi Sang-hun said Friday.

"North Korea's nuclear reprocessing facilities in Yongpyon are expected to be completed within this year. The North will likely be able to manufacture nuclear weapons in mid-1990s," Yi told the National Assembly Defense Committee. But he did not reveal further details. His remarks contradicted wire services reports that the North will be able to produce nuclear weapons within six months. [passage omitted]

Yi also said the Government is willing to discuss disarmament between South and North Korea in line with its efforts for building military and political confidence. He said the disarmament topics could be discussed in a proposed high-level political and military meeting between prime ministers from both sides. The minister said the Government will set up a coordinating committee for arms control between Seoul and Pyongyang to flexibly cope with changes in North Korea's attitude toward the South.

Defense Minister on DPRK Capabilities

SK0507005090 Seoul THE KOREA TIMES in English
5 Jul 90 p 1

[Excerpts] South Korea plans to open a trade office in Vietnam before the end of this year, Yi Son-ki, president of the Korea Trade Promotion Corporation (KOTRA), reported to the National Assembly yesterday. [passage omitted]

Defense Minister Yi Sang-hun said, when asked, that North Korea will have the capability to produce nuclear weapons by the mid-1990s.

He denied earlier reports by South China Morning Post that the Communist North will obtain the capability by the end of this year.

"The Defense Ministry and U.S. Forces Korea (USFK) reached a conclusion that North Korea will not be able to obtain the capability to produce nuclear weapons before the mid-1990s," said the minister.

North Korea is reported to have built a nuclear facility in Yongbyon.

As to the envisioned arms control talks with North Korea, Yi made it clear that substantial progress can not be made until the military power between the South and the North reaches and equilibrium.

Minister Yi said, "Mutual arms reduction by South and North Korea will be possible only after both sides take some confidence-building measures and reach a military power balance."

Yi said that the recent North Korean proposal on arms reduction contain some positive elements on mutual confidence-building, but that it is unrealistic to propose that both South and North Korea reduce their troops to 100,000.

The defense chief also said that nuclear weapons will not be used on countries without an agreement between the National Security Councils of Korea and the United States. He was denying the allegation that South Korea may be excluded in the decision concerning the possible use of nuclear weapons.

Measures Against DPRK Viewed

SK0407005290 Seoul THE KOREA TIMES in English
4 Jul 90 p 2

[Text] North Korea is likely to develop nuclear weapons in a bid to gain the upper hand over South Korea in possible arms control talks, the National Unification Board said yesterday.

Reporting to the National Assembly on the possibility of North Korea's possession of nuclear arms, the board said that the government "is watching closely moves in the North on nuke development in cooperation with our allies, such as the United States."

The board also said that the government would seek to increase pressure on Pyongyang to sign the safeguards agreement of the International Atomic Energy Agency (IAEA).

The IAEA agreement stipulates that subscriber countries should open their nuclear facilities to outside inspection.

While seeking to prevent North Korea from acquiring a nuclear strike capability, the government will take measures for national survival, in case its efforts fail, according to the board.

The North has refused to sign the agreement, while building what are believed to be nuclear fuel reprocessing facilities in Yongbyon north of Pyongyang.

Wire services reported last month that the North would be able produce nuclear arms within six months.

The board also reported to the Assembly that North Korea spent \$4 billion on arms imports between 1986 and 1988, and sold \$255 million worth of weapons to third-world nations.

Quoting statistics published by the Stockholm International Peace Research Institute, the board estimated that weapons the North imported from the Soviet Union in the 1980s included 30 MIG-29 fighters and 24 Sam-5 mobile surface to air missile systems.

USSR Asks Atomic Experts To Visit Chernobyl

SK2206073290 Seoul YONHAP in English 0715 GMT 22 Jun 90

[Text] Seoul, June 22 (OANA-YONHAP)—The Soviet Union has proposed that South Korea send two atomic experts to join an international survey team to investigate the ecological and other impacts of the nuclear accident in Chernobyl in 1986, officials at the Science and Technology Ministry said Friday [22 Jun].

The Soviet Union forwarded the proposal through Hans Blix, secretary-general of the International Atomic Energy Agency [IAEA], to South Korean Science and Technology Minister Chong Kum-mo during an IAEA board of directors' meeting in Vienna last week, the officials said. The investigation team will be composed of about 10 experts in August from the countries invited, they said.

Meanwhile, the South Korean Government has conveyed its intention to participate in a Soviet plan to inaugurate an international atomic energy research institute in Chernobyl. The Soviet Union has asked IAEA members to participate in the plan. The proposed institute will study the causes of the nuclear accident, analysis of damage of the nuclear reactor, impact on environment, methods to remove radioactive pollution and emergency measures.

THAILAND

Campaign Planned for Nuclear Power

51004302 Bangkok THE NATION in English 4 Jun 90 p 3

[Text] The Electricity Generating Authority of Thailand (Egat) will launch a Bt400 [baht] million public relations campaign next year to promote understanding about nuclear power, the Egat spokesman said over the weekend.

The plan will be finalized by Egat in August and would be implemented next year if approved by the Cabinet, said Subhin Panyamag, director of Egat's Public Relations Department.

Subhin said the three-year campaign would be carried out jointly between Egat, the Office of Atomic Energy for Peace and the National Energy Administration.

"We need a public relations campaign because Thai people are still afraid of nuclear-powered electric plants. I think it will take at least five years, or at most 10 years, for people to have a correct understanding about this," he said.

He said Egat and the other two agencies would propose the plan to the government by the end of August after studying various promotional strategies.

"The publicity campaign will be launched immediately after the government approves the project," the spokesman said.

Egat experienced strong public protest in 1976, when the project was proposed by Kasame Chatikavanij, Egat's general manager, who described the nuclear plant as "inevitable." The projected cost at that time was Bt13 billion, compared to Bt70 billion today.

Egat failed to get the project off the ground after a fight against environmentalists, who said the energy situation in Thailand at that time did not warrant a nuclear power plant.

The issue was raised again last year by PM's office Minister Anuwat Wattanapongsiri, who was appointed supervisor of Egat.

Subhin said this time that he believed a nuclear power plant would eventually be set up in the country, adding that Thailand needed an increasing amount of energy to cope with rising industrial-sector demand.

"The country may face a severe energy drop-off in the near future if we depend only on our existing energy sources [hydro-power and lignite]. A nuclear power plant is a must," he said.

The spokesman said the first nuclear power plant might be established on one of the country's islands to avoid provoking fears of its dangers.

The spokesman said Egat planned to borrow money from the private sector and from overseas to support the plan.

GERMAN DEMOCRATIC REPUBLIC

Growth of Nuclear Energy Examined

90GE0146Z Frankfurt/Main FRANKFURTER
ALLGEMEINE in German 23 May 90 pp N1-N2

[Article by Guenter Paul: "Nuclear Technology Expansion in the GDR?"]

[Text] For some time past the future of energy supplies has been hotly debated in the GDR. In 1986 each GDR resident used 222 gigajoules of primary energy per annum. This volume was exceeded only in the United States (284 gigajoules) and Canada (277 gigajoules). At the 1990 annual conference on nuclear technology in Nuremberg, Reiner Lehmann of the Nord nuclear power plant (Lubmin near Greifswald) said that obsolete equipment and the low rate of efficiency of energy conversion and utilization represent some of the reasons for the excessive consumption in the GDR. An international comparison of per capita consumption of electricity shows the GDR to be in 10th place with 5,787 kilowatt hours per resident and year. In view of the fact that power plants operating with brown coal excessively pollute the environment, many people in the GDR are considering how to continue using the nuclear reactors which are available but also technically obsolete and supplement them with additional reactors, without unduly disregarding safety requirements.

The GDR has only Soviet pressurized water reactors type WWER ("water-water-energy-reactor"). In such plants, the cooling water (that is also the denaturant) is conducted through the reactor nucleus at high pressure. The resulting heat is released to a separate hydrological cycle. The water of the secondary cycle is vaporized and drives the turbines of the electricity generators.

At the present time 13 reactor blocks are in operation, under construction or preparation in Rheinsberg, Lubmin, and Stendal. They include four different types of the WWER line. The oldest is the WWER-2 with a 70-megawatt output. It entered the network in Rheinsberg in 1966 and is to be shut down in 1992. GDR industry supplied a great deal of its own designs to this reactor, developed parallel to the prototype of Soviet pressurized water reactors—the WWER-210 that began operating in 1964 in Novo-Voronezh. In Nuremberg, Professor Gerhard Ackermann of Zittau Technical College said that the Rheinsberg plant resembles Western reactors by, for example, featuring vertical steam generators.

The steam generators in purely Soviet reactors are mounted horizontally. In case of breakdowns, the water is able for six to seven hours to release the residual heat of the reactor, and there is more time to adopt emergency measures than is the case in Western nuclear power plants. This type of construction proved valuable when, in 1975, a cable fire broke out in block 1 of the Nord power plant at Lubmin and caused a complicated incident. Gerhard Ackermann discerns similarities

between that event and the incident at Three Mile Island. Though the cable fire had increased the danger, the fact that sufficient time remained in Lubmin to adopt countermeasures meant that the fuel elements suffered no damage nor was there an unacceptable release of fission products. On the other hand, horizontal steam generators turned out to be a liability when corrosion of their pipe supports produced leakages in block 1 in 1982. No final verdict is in yet as regards the general reaction of horizontal steam generators to breakdowns and accidents. Their "thermo-hydraulic" behavior is now to be ascertained by analytical and experimental studies.

In addition to the vertically mounted steam generator, GDR scientists supplied other developments to the WWER-2 reactor in Rheinsberg. However, going against Soviet proposals, in 1968 the government decided against any further involvement in the development of nuclear power plants and to unconditionally rely on Soviet technology for the importation of nuclear power plants. Four purely Soviet reactor blocks type WWER-440 (1-4) with 400-megawatt output each were installed in Lubmin. Two each of these blocks are operated jointly with respect to ancillary equipment and water supply. It is currently intended to modernize them for operation for a limited time and to shut them down finally at some time in the 1990's. The safety equipment of these long obsolete reactors is based on a typical Soviet concept: Exceptional robustness to be achieved by the use of tough austenitic materials in the coolant cycle and ample load reserves. The Soviets believed that it would then be unnecessary to make any further demands on safety equipment. A 500-mm diameter break in the main coolant line seemed impossible. A 100-mm diameter leak was defined as a controllable design incident. Blocks 2 and 3 are currently disconnected due to advanced embrittlement. This embrittlement is to be eliminated by annealing—a tried and tested procedure.

Blocks 5-8 of the Nord nuclear power plant, to be taken into service by 1995, are of the WWER-440/213 type. The reactor and cycle design barely differs from that of blocks 1-4. However, they have been significantly improved from the aspect of safety equipment. A 500-mm diameter break in a main coolant line is assumed to be a design incident. The blocks are not yet secured against aircraft crashes, and considerable arrears persist with respect to control equipment.

It is typical for the WWER-400 blocks that the space housing reactors and primary cycles is "pressure space," because the manufacturers wished to forego full pressure containment. The structural engineering-related relatively small design pressure requires a sprinkler system in case of incidents, in order to limit and decrease pressure. Due to the totally different method of construction, it is almost impossible to conduct a safety comparison with Western nuclear power plants. Some of the characteristic features of the WWER-440 are vertical looping bends, so to speak "looping" pipes in the hot trains of the cooling cycles, that will, in case of an incident, result in a blockade by vaporization in the

cycle. In conjunction with the horizontal steam generators, this affects the behavior of the plants in incidents. Future studies are to show what may happen in the individual case. GDR researchers intend to use an incident computer program, developed in the Federal Republic. Zittau's Peer Draeger said in Nuremberg that personnel of the Nord nuclear power plant and the Zittau Technical College will revise the program for block 1 in Lubmin.

The reactor blocks of the Stendal nuclear power plant now being constructed will be more up-to-date than the Lubmin reactors. The first double block will consist of two reactors type WWER-1000/320. In Gerhard Ackermann's opinion, their design parameters and safety equipment are "analogous" to Western concepts. They have one pressure reservoir each, and this also provides protection against external forces. However, the diameter of these pressure reservoirs is limited to 4.5 meter, because they need to be carried by rail. This affects, among others, the radiation exposure of the material. As the reservoirs do not quite meet the international standard of reactor development, it is now considered to equip blocks 3 and 4 in Stendal with Konvoi plant by Siemens instead of WWER-1000/320 reactors. They could be operational by the year 2000. Blocks 5-8 in Lubmin and 1-2 in Stendal are to be equipped with electrotechnical plant and unit coordinators produced in West Europe. This solution has worked well at two Soviet WWER-440 reactors in the Finnish Loviisa nuclear power plant.

HUNGARY

Paks Nuclear Waste Transport Departs for Soviet Union

25000740Z Budapest NEPSZABADSAG in Hungarian
7 Jun 90 p 5

[Text] At 0700 hours yesterday the 129 consumed fuel canisters produced in the first unit of the Paks nuclear power plant left the territory of the Hungarian Republic. The nuclear train consisting of four containers is heading toward the interior of the Soviet Union, under heavy guard.

Yesterday afternoon we asked Laszlo Gyarmati, an employee at the information office of the Paks Nuclear Power Plant Enterprise, why the transit of the nuclear train through Hungary is being handled so secretly.

[Gyarmati] "We were intent on announcing the first shipment of 1989, so that the populace would be aware of the kinds of security precautions we implement. But Soviet security requirements do not enable us to announce to the public the timing or routing of the transport."

The nuclear plant employee said that they are counting on the probable disapproval of the Soviet partners even for [releasing] this information.

It is expected that the transport will be repeated in 1990, because the basins next to the nuclear power plant units where consumed fuel canisters rest for five years are filled. The canisters removed from Hungary are refurbished in the Soviet Union and are put to further use.

Nuclear Research Reactor To Be Restarted

25000743Z Budapest NEPSZABADSAG in Hungarian
4 Jun 90 p 8

[Interview with Zoltan Szatmari, Central Physics Research Institute acting director, by Katalin Magos; place and date not given: "Will the Csilleberc Reactor Be Restarted?"—first two paragraphs are NEPSZABADSAG introduction]

[Text] At the time the research reactor of the Central Physics Research Institute [KFKI] was shut down four years ago on 1 May 1986, they scheduled its renewal to take place over a two-year period. This is exactly the same amount of time as it took to build the reactor three decades ago. After changing the deadline several times, they planned to restart the reactor on the 30th anniversary of the first start, in April 1989. But the reactor was not restarted at that time and new promises were made instead: The reactor will operate at the end of 1989. They were also unable to comply with that promise, moreover to this date the reactor is not operational.

But people's imaginations are working even more, particularly since word has spread that foreign experts have examined the equipment. Various rumors are floating around about their report, causing unease in the neighborhood. On the other hand, others say the financial problems are the cause of delay experienced in restarting the reactor. To clarify this situation we asked Zoltan Szatmari, the acting director of KFKI, to provide us with information.

[Szatmari] There are prosaic reasons for the postponement of deadlines: the lack of delivery discipline on the part of enterprises that took part in the renewal. At the same time, it would have been inappropriate to accelerate the final phase of the work which we performed, because the accuracy of this work determines the safety of the reactor.

[Magos] Is that why the renewal work was examined by international experts?

[Szatmari] The National Atomic Energy Committee [OAB] which places this reactor in operation requested the International Atomic Energy Agency [IAEA] to dispatch experts to perform a security analysis, and to express opinions regarding the equipment and the start up program quite independent from this [final phase of the work]. Three of their experts worked for 10 days at Csilleberc, and their final report, contained in a thick volume, indicates that what they saw and heard was good. They also made some useful recommendations.

[Magos] I do not know to what extent these statements will reassure people in the neighborhood. They are frightened about restarting the reactor.

[Szatmari] I am aware of the concerns of people who live here, but I find these concerns to be without foundation. And I do not understand their protest at all, because whoever lives in the vicinity of the KFKI was aware of the existence of the reactor at the time he moved here. That is, at the time the reactor was built, Csillebér was a green pasture on the edge of the city, far removed from residential buildings and vacation resorts.

In my view, the fear manifested by the population much rather stems from the fact that nuclear reactors are still shrouded in secrecy. This is one reason why we believe that public education is important, continuous information concerning the reactor, including small or large shutdowns. We still hold regular presentations in the vicinity; we go wherever we are invited.

[Magos] Have financial problems hindered the reactor's renewal?

[Szatmari] Thus far we have had no financial concerns, even though the 780 million forints were expended from state budget funds for the renewal, and this amount exceeds the originally budgeted amount by 100 million forints.

[Magos] It is a well-known fact that operating research reactors is costly. What kinds of expenses does one have to deal with in the case of the KFKI reactor, and who foots the bills?

[Szatmari] Its annual maintenance at today's prices amounts to between 60 million and 70 million forints. I hope there will be money for it, because for the time being, thus far we have no promise for funding, but we are not aware of the opposite either. Thus I am confident that within the scheduled time frame, i.e. this summer, the so-called physical start up of the research reactor may begin, and that it may be fully operational by the end of the year.

ARGENTINA

Committee Cites Need To Promote Nuclear Programs

PY3006035390 Buenos Aires DYN in Spanish
0108 GMT 30 Jun 90

[Text] Buenos Aires, 29 Jun (DYN)—The Permanent Argentine-Brazilian Committee for Nuclear Policy has stressed the need to promote their countries' respective nuclear programs. In this regard, they have agreed on the need to increase cooperation and integration between the two countries.

The committee, which today ended its two-day meeting here, decided to hold its next meeting in Brazil in the last quarter of 1990.

The Argentine delegation was headed by both Enrique Candiotti, Foreign Ministry director for strategic matters, and Manuel Mondino, National Atomic Energy Commission chairman.

The Brazilian delegation was headed by both Celso Amorin, Foreign Ministry Economic Department head, and Jose Luiz de Santana Carvalho, National Commission for Nuclear Energy chairman.

The Foreign Ministry has reported that in this meeting, the first since President Fernando Collor de Mello took power, the two delegations ratified "their governments' firm decision to strengthen their bilateral relations in the nuclear sector under the integration process."

They also reasserted the "importance of nuclear power for the welfare of their people, and for economic, scientific, and technological development. They also pointed out their commitment to use nuclear power exclusively for peaceful purposes."

President Menem Dedicates Project, Starts Reactor

PY2706231390 Buenos Aires TELAM in Spanish
1922 GMT 27 Jun 90

[Text] Buenos Aires, 27 Jun (TELAM)—President Carlos Menem has said that the nuclear industry is an "important source of income" for the country. He stressed that the United States has not imposed "any limitations" in this area. He added that "for the time being" Argentina will not modify its traditional position of opposing the ratification of the nonproliferation agreements.

Menem said this during the visit he paid today to the Ezeiza Nuclear Center where he dedicated the Celca (hot cells) project, the first in Latin America and the Southern Cone. He also started the RA 3 reactor, which produces radioisotopes. This reactor was idle for more than two years while its core was modified.

It has been reported that these two achievements represent an important saving in foreign currency. Radioisotopes have been imported since February 1988 at a cost of \$1 million per year. The new hot cells will mean that radioactive elements can be analyzed in the country and it will now be possible to maintain surveillance of the reactors. The reactor is located in the Atucha I nuclear plant and was built in Germany at a cost of \$1.8 million.

Menem went by helicopter to the Ezeiza Nuclear Center where he arrived at 1100. He headed for the Celca laboratory where he dedicated the project. From the RA 3 reactor control unit he started the 5-megawatt reactor. He finally toured the facilities of the Argentine Nuclear Fuel Corporation, Inc. [Conuar], and addressed the 1,200 employees. The Conuar facilities are located in a 840-hectare property near the international airport.

In an unscheduled news conference, Menem said that these achievements show "the technological and scientific progress reached by our country in the area of nuclear development." He pointed out that the National Atomic Energy Commission [CNEA] "produces for the country and exports reactors and materials to benefit other countries."

Menem commented on some political matters and other current issues before referring to the conclusion of the Atucha I nuclear plant. He said: "This matter is included in our projects, but we should first solve the critical situation in the country." Asked about reports on the possible privatization of the third Argentine nuclear plant, Menem said: "This is just a rumor."

Menem was accompanied by Defense Minister Humberto Romero; Secretary General of the Presidency Alberto Kohan; CNEA Chairman Manuel Mondino; Secretary for Technical and Scientific Affairs Raul Matera; Enrique Candiotti, the Foreign Ministry director for strategic matters; Miguel Nacul, the head of the Chamber of Deputies Science and Technology Commission; and authorities of the military, civilian, and religious sectors.

Addressing the Conuar employees, Mondino pointed out that progress has been made despite the economic problems. He stressed "the effort, the work, and the solidarity of the personnel." He added that the CNEA has opened its doors to the "community so that the people can be aware that we have secure and reliable facilities." He said that "the main defenders of the ecology" are the members of the nuclear organization.

BRAZIL

Monteiro on Missile Development for Iraq

90WP0109B Sao Paulo FOLHA DE SAO PAULO
in Portuguese 25 Jun 90 p A8

[Report by special correspondent Roberto Lopes in Brasilia]

[Text] An attempt at self-promotion. That is the way Minister of Aeronautics Socrates Monteiro views the interview given by Brigadier General (Reserve) Hugo de Oliveira Piva last month to announce that his consulting company, HOP, had hired and sent to Iraq 23 Brazilian engineers with the capability to develop a sophisticated air-to-air missile in that country.

"He (Piva) said that the news item was a dirty trick they played on him," the minister said. Actually, Brig. Gen. Piva does not make much of a secret of his activities. Early last month, enroute from Paris to Sao Paulo, Piva met with a businessman on the plane who represents several Israeli manufacturers in Brazil. During the flight, the owner of HOP told the man the same story he had leaked to the press.

He said to this friend that the Iraqi authorities have a lot of money to invest in the project and that its objective really is to develop an air-to-air missile. According to Monteiro, the plans for the Brazilian "Piranha" missile—which, according to the news report, would serve as the foundation for the Brazilians' work in Iraq—"are kept in a vault." Monteiro insists that the Brazilian Government has nothing to do with the work those 23 Brazilians are doing in Iraq.

Whether or not it is merely an attempt to promote his own image, the fact is that Brig. Gen. Hugo de Oliveira Piva managed to make news on the international scene. His interview was reproduced in newspapers in the United States, France, West Germany, Switzerland, and elsewhere. Last week it was still having repercussions. On Wednesday morning the Mexican TV network Televisa sought out the minister of aeronautics to try to interview him on the subject of the "Piranha." Monteiro assigned Sergio Ferola, director of the Aerospace Technical Center (CTA), to meet with the Mexican reporters, and recommended that he make it clear that the government has nothing to do with HOP's business deals.

The news item has also created a rift in Brazil-Israel relations. It was the subject of a report by the Israeli Embassy in Brasilia to its government in Tel Aviv. Israeli officials became concerned about the matter and immediately responded that the news was not good. Itamaraty was also informed about the discomfort caused in Tel Aviv by the reports of cooperation between the Brazilians and the Iraqis.

Brig. Gen. Piva has been known for his daring initiatives. He won fame in the first half of the 1980s as director of the CTA, at the time when the "Piranha" was considered a priority program. The idea was to develop a missile capable of hitting an enemy aircraft head-on (i.e., with the target reduced to its smallest possible area). At that time, Piva was also involved, secretly, in another ambitious project: the building of a military base in the Cachimbo mountains in southern Para State, to be used for underground nuclear testing. Lately, HOP has been doing consulting work for the Sao Paulo firm of Orbita, established in January 1987 to manufacture missiles and

rockets but which, ever since last year, is trying to acquire some capability in the area of artificial satellites. Orbita was also involved in the "Piranha" program, but was forced to stop work on it in 1988 for lack of funds.

Progress in Heavy Water Production Discussed

90WP0099A Rio de Janeiro O GLOBO in Portuguese
26 May 90 p 16

[Article by Elza Oliveira]

[Text] Curitiba—By the end of this year, Brazil may succeed in producing 40 liters of heavy water (deuterium oxide) in a concentration of 99.6 percent. The first steps toward mastering that technology—which the country cannot acquire abroad because it has not signed the Nuclear Non-Proliferation Treaty (NPT)—are being taken at the Brazil Peroxides plant in Curitiba. Under the terms of an agreement signed with the National Nuclear Energy Commission (CNEN) last year, the firm is beginning the process of concentrating heavy water, which is used as a moderator in natural uranium reactors like those used in Argentina.

Yesterday marked the start of the project's third phase, the purpose of which is to achieve a 10-percent concentration—that is, 100,000 parts per million. The remaining 90 percent will be the responsibility of the CNEN, which will organize the fourth and fifth phases of concentration at the Parana Technology Institute (Tecpar) or at the commission's own laboratories in Rio de Janeiro. The process being used is catalytic exchange combined with electrolysis.

"Signing the Non-Proliferation Treaty is the same as submitting to the law of the strongest. We are not interested in developing nuclear weapons, but if Brazil were a signatory to the document, we could not even carry out this research," says engineer Teofilo Portela Chagas, who is overseeing the project for the CNEN.

He says that Brazil needs the technology for obtaining heavy water in order to guarantee its development because all the projections indicate that hydrogen will be the fuel of the future.

"There is no such thing as bad technology. What there is is bad use of it: the same knife that we use to slice a good barbecue can also kill a person," says Chagas, a student of the nuclear question who was a member of the first research group for the production of heavy water. That group was set up at the IME [Military Engineering Institute] in 1964.

Brazil Peroxides was chosen to be a partner in the research—since heavy water, being a material used in the nuclear industry, is a monopoly of the Federal Government—because the firm has the necessary facilities for carrying out the project at low cost. The plant has a unit for the electrolysis of water that was intended to produce

15,000 metric tons of hydrogen peroxide (oxygenated water) per year, and it can produce as much as 22,000 metric tons per year.

Marcio Coimbra, the firm's industrial manager, says: "From the standpoint of Brazil Peroxides, this project enables us to study the possibility of reducing the cost of producing electrolytic hydrogen by recovering deuterium oxide as a byproduct."

Chagas says: "Fossil fuels are going to become scarce, and hydrogen, which is renewable and nonpolluting, will be the main engine fuel in the next century. One proof of this is the fact that the Mariner interplanetary probes launched by the United States are looking for the existence of heavy water in the universe, and they have found deuterium in the atmospheres of Jupiter and Saturn. Perhaps that is where spacecraft of the future will refuel for their trips through space."

Congress To Examine Parallel Nuclear Program

90WP0099B Sao Paulo O ESTADO DE SAO PAULO in Portuguese 1 Jun 90 p 15

[Article by Rubens Santos]

[Text] Brasilia—The National Congress will appoint a joint congressional committee on Thursday [7 June] to investigate the autonomous nuclear energy program—the so-called parallel program. The CPI [Commission for Congressional Investigation] was called for by Deputy Anna Maria Rattes (PSDB [Brazilian Social Democracy Party], Rio de Janeiro), and its purpose is to determine whether the country really needs to abandon the hydroelectric option and generate electricity through nuclear power plants. The proposal to establish the CPI was supported by 216 congressmen, and the committee is to complete its work by November.

"The time has come for Congress to touch a sore spot," said Deputy Guilherme Afif Domingos (PL [Liberal Party], Sao Paulo). "There are a number of poorly explained projects that have devoured public funds under the mantle of secrecy with no controls whatever," he said. As one of those projects, the leader of the PL [Liberal Party] mentioned construction of the Angra-1 plant, which was the result of a commercial agreement signed with the U.S. firm of Westinghouse. Anna Maria Rattes says: "With the CPI, we are going to do away once and for all with the government's old habit of investing without proving that it is capable of getting a good deal and eliminate misinformation."

According to the deputy, nuclear energy may be "a necessary evil, but the Congress cannot remain uninvolved in a program of this size, which is expanding in defiance of the economic rules and runs counter to the constitutional text." Approval of the CPI brought reactions from the nuclear program's leaders. In the opinion of Admiral Othon Luiz Bastos, coordinator of the Aramar Experimental Center, where the country is

developing a uranium enrichment process, the committee is positive "and will prove that the public funds expended there have been used properly."

The chairman of the National Nuclear Energy Commission (CNEN), Jose Luiz de Santana, feels that the congressmen are looking at the nuclear program solely from the political viewpoint and ignoring its scientific and technological aspects: "If they adopt that viewpoint, they will naturally conclude that all the research done by the universities is also marginal because none of it has been vetted by Congress." According to Santana, if President Fernando Collor approves the proposals in the program, four more nuclear power plants will be built.

New CNEN Safety Director Takes Office

90WP0099C Rio de Janeiro O GLOBO in Portuguese 8 May 90 p 8

[Text] Nuclear physicist Anselmo Salles Paschoa, 52, took over yesterday as a director of the National Nuclear Energy Commission (CNEN). He cited the Constitution and guaranteed transparency in connection with nuclear activities carried on in Brazilian territory. Paschoa took charge of Executive Directorate 1, which is responsible for nuclear safety and equipment inspections. After tomorrow, he will visit Goiania to inspect the atomic waste that has been stored in Abadia de Goias since the cesium-137 accident that occurred in September 1987.

"There is no problem with leakage from the drums and tanks in which that material is stored. But I have appointed a committee to decide whether or not the waste should be transferred to another site," said Anselmo Paschoa.

The new director is a professor at the Pontifical Catholic University of Rio de Janeiro. He was one of the people responsible for a report drawing attention to a number of shortcomings at the Angra-1 nuclear power plant, which was closed by the courts following publication of the document. He was sworn in by the chairman of the National Nuclear Energy Commission, Jose Luiz de Santana Carvalho, at a ceremony held at CNEN headquarters in Botafogo.

Foreign Minister To Discuss Nuclear Issue in Europe

PY2806032290 Brasilia Domestic Service in Portuguese 2200 GMT 27 Jun 90

[Text] Foreign Minister Francisco Rezek traveled today to Europe. There, he will meet with his counterparts from France, Italy, and Portugal. In France, Foreign Minister Francisco Rezek will be received by the prime minister, the person in charge of Latin American affairs, and the administrative reform minister.

Foreign Minister Francisco Rezek reported that, during his tour, he intends to talk about the political changes in

Europe, Brazilian access to high technologies, the environment, the relations between the European continent and Latin America, and the nuclear issue.

Regarding the nuclear issue, Foreign Minister Rezek intends to commit the French to not using any nuclear device in Latin America. Notwithstanding, there is the Tlatelolco Treaty, banning the use of nuclear devices in Latin America, although it has yet not been signed by Paris, Buenos Aires, and Havana precisely because of their points of view.

Regarding the environment, Foreign Minister Francisco Rezek will carry with him arguments demonstrating that Brazil must no longer be viewed as a predator of nature. Rezek also reported that he will make arrangements for Portuguese President Mario Soares to visit Brazil in late 1990 or early 1991.

The foreign minister is accompanied by Ambassador Jose Nogueira, Rezek's office chief.

Debt, Delays Plague Joint Nuclear Program With FRG

*PY2906013590 Sao Paulo FOLHA DE SAO PAULO
in Portuguese 27 Jun 90 p A-6*

[Report by Regina Eleuterio]

[Text] Rio de Janeiro—The Brazil-FRG nuclear agreement today completes 15 years of existence with a debt of \$7 billion (approximately 420 billion cruzeiros in the parallel market) and a work timetable delayed by at least 14 years. The government has also announced its decision to review contracts for the construction of eight plants. Brazil is paying \$1 million (60 million cruzeiros) daily in interest alone on loans taken out for the construction of the Angra II and III nuclear plants in Rio de Janeiro.

Originally scheduled to begin operations in 1980, Angra II will not be ready until 1994, and Angra III remains simply a ditch. For the purchase of equipment and the construction of the two plants, which have not yet generated any power, \$2.45 billion (147 billion cruzeiros) has been invested. According to Brazilian

Nuclear Industries (INB), the state enterprise responsible for the industrial stage of turning uranium into nuclear fuel, at least \$2.55 billion (152 billion cruzeiros) will be necessary to finish the work.

In a document sent to the two presidential candidates last year, the INB argued that the delay in the timetable was mainly responsible for the increase in costs. The document also mentions the cost to maintain, idle and unfinished, the infrastructure to guarantee self-sufficient construction of nuclear plants.

The Nucleabras [Brazilian Nuclear Corporations, Inc.] Heavy Equipment, Inc. (Nuclep), which was created to manufacture equipment for the nuclear plants and had required an investment of \$350 million (21 billion cruzeiros), has practically been paralyzed.

In addition to the lack of resources, the contracts made through the agreement with the FRG for the transfer of technology must be reviewed. When Collor was campaigning, he said that his government program envisioned the construction of Angra II (investments in this sector have risen to 69 percent of the overall cost) and a review of the Angra III project.

A decision to review the entire Brazilian nuclear program, including the agreement with the FRG, was announced in April by Jose Luiz Carvalho, chairman of the National Commission for Nuclear Energy (CNEN). A group has been created among members of the military ministries, the CNEN, the Environmental Secretariat, the Science and Technology Secretariat, and civilian representatives to renegotiate the program. The result of the meetings, which will be held in Brasilia, will be sent to President Collor.

The contracts with the FRG provided for Brazil's gradual participation in the construction of eight plants. Angra II will reportedly be built with 35 percent Brazilian participation, while Angra III will be built with 45 percent Brazilian participation. Only after the construction of the fourth plant will Brazil be in a position to build Brazilian nuclear plants with a greater percentage of participation than the FRG. Angra I, the only plant to begin operations, is not included in the Brazilian-FRG agreement.

INTERNATIONAL AFFAIRS

Egypt's Regional Non-Proliferation Plan Detailed

90WP0100A Cairo AL-JUMHURIYAH in Arabic
24 May 90 pp 2-3

[Interview with Dr. 'Ali Fahim al-Sa'idi, chief executive officer of the Nuclear Power Stations Authority, by Sa'd Hajras and staff writers; place and date not given: "Nuclear Power Stations Authority Chief Tells AL-JUMHURIYAH, 'President Mubarak's Initiative To Rid Region of Weapons of Destruction Took Many by Surprise'; How the President Sold His Initiative to the Superpowers; Examples We Have Show That Initiative Can Be Implemented; Egypt Participates in Writing International Protocol To Ban the Burial of Harmful Waste Materials in Third World Countries; Egypt Is Not Considering Production of Nuclear Bomb; Privileges of Five Nuclear Countries Indicate Imbalance of International System; How Did Egypt's Ambassador Render U.S. and Israel's Representatives to International Atomic Energy Agency Speechless? Israel Is Developing Weapons of Mass Destruction, and Arabs Have the Right To Protect Their National Security"—first nine paragraphs are AL-JUMHURIYAH introduction]

[Excerpts] Is living in a world free from weapons of mass destruction an idealistic dream? By the same token then, is it not a disturbing and frightening nightmare to live in a world which may explode any moment? Is it not a nightmare to be living in a world in which everything, including all parties and everyone involved in disputes and conflicts, can be destroyed in the blink of an eye?

Gorbachev stunned the whole world when he declared that the survival of mankind was a greater principle than the conflict between capitalism and communism. He stunned the whole world by declaring that the nuclear arsenal in both camps could destroy our planet 32 times. He then asked, "Why not save ourselves from this imminent nuclear suicide?"

Although Brezhnev had refused the zero option, Gorbachev accepted a double zero option. What had been inconceivable happened, and Moscow and Washington agreed to retire an entire generation of nuclear missiles in preparation for the further elimination of dreaded nuclear weapons.

Can this be an example for us? Can we follow Moscow's and Washington's lead in the Middle East? Can we actually live in a Middle East that has no nuclear weapons and no weapons of mass destruction? Is this an example with a difference? Whereas Moscow and Washington are strategically balanced, no such balance exists between Israel and the Arabs.

Will Israel give up its obstinate and overbearing posture now that the Arabs have developed some deterrent post-traditional weapons which can cause deaths in Israel? Or will that fact cause Israel to become more aggressive and to exacerbate the arms race in the region?

Do our previous experiences in the region to establish zones that are free of weapons of mass destruction give us reason to hope that we can achieve that objective in our region, or do they indicate that we cannot hope to achieve our objective?

Is a regional wish to make the region free of such weapons enough to achieve that objective, or are guarantees from the five members of the nuclear club necessary and required?

What is the status of President Husni Mubarak's special initiative calling for the Middle East to become an area free of weapons of mass destruction? What is the status of this initiative on this complex issue?

To find answers to these questions AL-JUMHURIYAH invited Dr. 'Ali Fahmi al-Sa'idi, chief executive officer of the Nuclear Power Stations Authority, as its guest for this interview. [passage omitted]

[Hajras] What are the specifics of this resolution?

[al-Sa'idi] The resolution urges the countries in question, especially those in the Middle East, to take practical and essential steps to implement the proposal which would make the Middle East a region free of nuclear weapons. To achieve that, the resolution calls upon the countries of the region to do the following:

- 1. To become signatories to the nuclear nonproliferation treaty.
- 2. Until all nuclear weapons are removed from the region, countries in the region which are not signatories to this treaty have to allow the International Atomic Energy Agency (IAEA) to inspect all their nuclear facilities and activities.
- 3. The resolution calls upon the countries of the region to declare their support for the goal of removing nuclear weapons from the region and to file their declaration of support with the Security Council.
- 4. At the same time the resolution calls upon these countries to stop developing, producing, testing, and acquiring nuclear weapons. The resolution calls upon the countries of the region not to permit nuclear weapons to be stored on their own soil or in territories under their control.
- 5. The resolution calls upon the five nuclear countries (that is, America, the Soviet Union, France, England, and China) to help establish that nuclear-weapons free zone. It asks them to refrain from any action which would violate the letter and spirit of this resolution, and it asks the UN secretary general to monitor compliance.

[Hajras] Has any part of this resolution materialized?

[al-Sa'idi] As I said, this resolution was issued and reaffirmed repeatedly from 1974 to 1988. Something new happened in 1988: one paragraph was added to the resolution, charging the UN secretary general with the task of asking the countries of the region what they

thought about the matter. On that basis the secretary general formed a task force of international experts to study the matter. This task force, which is a committee made up of experts from the United States, Sweden, the Netherlands, Yugoslavia, and Brazil, started looking into the situation in the region. It is looking into each country's declared nuclear activities and operations, and it is also looking into each country's undeclared but well-known nuclear activities and operations. The committee is looking into the compliance of each country that is signatory to the nuclear nonproliferation treaty, and it is considering the future intentions of countries which are not yet signatories to that treaty. These preliminary studies would be followed by a visit to the countries of the region. The committee, which was in Egypt recently and left it two days ago, will visit other countries in the region. The committee will then submit a report to the UN secretary general to clarify the situation and indicate what the countries in question think about the matter. This is being done to make the Middle East a nuclear weapons free zone and to employ the means which can push this proposal forward.

Verification and Inspection

[Hajras] Are members of this committee authorized to inspect nuclear activities in the countries of the Middle East?

[al-Sa'idi] As I said, this committee starts by taking steps to identify existing nuclear activities and capabilities and to determine the positions and opinions of the countries in question about the subject at hand. If the countries agree and express their desire and willingness to make the region free of nuclear weapons, the committee then shifts to technical matters, which include asking the countries in question to sign the nuclear nonproliferation treaty. Each signatory to the treaty is required to make public a list of all its nuclear facilities and materials which could be involved in the nonproliferation of nuclear weapons. To guard against the possibility that any country might conceal some of these facilities, all countries are required to allow inspection of their facilities by the International Atomic Energy Agency (IAEA).

[Hajras] What are the means of conducting such inspection?

[al-Sa'idi] IAEA will conduct its inspection of a country's nuclear facilities if that country signs the treaty and agrees to allow inspection of its facilities; if it makes a voluntary, unilateral declaration to that effect; or if a law is passed declaring the area free of nuclear weapons. IAEA is well staffed with experienced inspectors who can test and evaluate all the nuclear capabilities of a country by using highly advanced methods, equipment, and devices. Those inspectors go to the country in question; they see its list of nuclear facilities and materials; they verify everything on that list down to the smallest details; they examine the books; and they check what comes in

and what goes out. IAEA inspectors examine the materials that were converted, and they have methods of verification which present no problems.

[Hajras] But can't a country mislead and deceive by engaging in nuclear activities for nonpeaceful purposes under the cover of carrying out activities which appear to be for peaceful purposes? How can the distinction be made?

[al-Sa'idi] State sovereignty remains supreme in international law, and the United Nations cannot inspect nuclear facilities in any country without that country's approval. Furthermore, inspectors rely on information given to them by that country showing what that country has and does not have. Here is where a country can conceal what it has. But IAEA has another method for finding out what that country has. It asks countries which export nuclear technology to provide it with information about its exports to the country in question. A well-known example of that is the case of heavy water which Norway exported to Israel. What happened to those 20 tons of water? Inspectors can get to the truth by tying loose ends together.

[Hajras] Let's assume that the country which sold the materials did not provide truthful information or that it provided no information to begin with. Or let's assume, for example, that the committee is told that a quantity of uranium was lost at sea en route to a certain country. What would the inspectors do in a case like that?

[al-Sa'idi] Something like that would be very difficult to verify. It is being said now, however, that something can be done to redress such possibilities. Ultra-modern methods of inspection as well as satellites can be used to measure radiation which reveals the presence of nuclear facilities which are concealed by some countries.

[Hajras] Let's also assume that the committee went to a given country to conduct its inspection and that it knew that the country in question had other nuclear capabilities which it was concealing. Does the committee have the right to ask that it inspect these facilities?

[al-Sa'idi] This is a point that has to do with sovereignty. The committee cannot do that, and that is why it turns to another party. It turns to the country which exported the nuclear technology.

Mubarak's Initiative

[Hajras] The fact of the matter, regardless of these technical details, is that the initiative to get nuclear weapons out of the Middle East is still the subject of discussion. Although that subject was proposed more than 16 years ago, nothing concrete has been accomplished. Is President Mubarak's announcement of his recent initiative to make the Middle East an area free of weapons of mass destruction an alternative to the first plan? Has he too given up on the other initiative?

[al-Sa'idi] President Mubarak has undoubtedly succeeded in recent years in turning down the heat in the area and reducing tensions in the region by helping to bring an end to the Iraq-Iran war. He also helped narrow the political rift between some Arab countries, and he promoted efforts for peace in the Arab-Israeli conflict. All this gave us hope that a climate of peace was gradually moving into the area. Unfortunately, however, some countries in the region whose interests are not served by such an approach to peace tried to contrive a marginal battle by overstating their case against the activities of Arab countries which, they said, were striving to acquire weapons of mass destruction, especially chemical and biological weapons. At the same time, no one doubts that Israel itself is developing weapons of that kind. And Arab countries will naturally seek the means with which they can protect their national security when they see a partial or a total threat to their national security.

That is why, based on the same premise which moved Mubarak to advance the peace process, Egypt proposed the recent initiative to make the area free of weapons of mass destruction.

The goals of Mubarak's initiative are to continue promoting the peace process; to remove any obstacles that are put up to stop this process; to remove the threat of mass destruction for everyone; and to divert funds which are being spent on deterrence and counter-deterrence and to spend those funds on development. This initiative undoubtedly took many people by surprise. It took the air out of the hate campaign which had targeted Iraq in particular and the Arab countries in general. Its timing was politically advantageous because it placed the attacking countries in an embarrassing position. Here we were calling for the removal of all weapons of mass destruction from the area. "Why then are you complaining, if you agree with us about that?"

[Hajras] Is Mubarak's initiative merely a plan that he is advocating or is there a machinery to implement it?

[al-Sa'idi] It is customary to start by asking other countries to support the idea. This is what President Mubarak did, especially with the superpowers. He won the support of China, the Soviet Union, and Britain when he visited these countries recently. I do not believe that France and the United States will object to his initiative. After we have the approval of the five nuclear countries, we can look into the machinery for implementing the initiative.

[Hajras] Let me rephrase the question. Is President Mubarak's initiative an idealistic proposal that he is advocating, or is there a real and practical chance that it can be implemented?

[al-Sa'idi] Nuclear weapons are far more complicated than other weapons of destruction. Therefore, taking a positive step on the former will make it easier to do something with the latter. It would be easy to follow similar methods and to apply them to other weapons of

destruction. Let's not forget that an international conference was held in Paris last year to prevent the proliferation of chemical weapons. Also, let's not forget that many countries, including Egypt, approved of the outcome of this conference. Egypt expressed its concern with the fact that chemical weapons must be considered in conjunction with other weapons of mass destruction to maintain balance in international action.

[Hajras] It is obvious that Israel is the main obstacle. Are international pressures enough to make Israel accept such a peaceful initiative?

[al-Sa'idi] No, they are not. A country needs to share a common interest with other countries to make such a decision. Such an interest can be something positive or negative. That is, the countries can start working together, or they can avoid a common threat.

Israeli Wrangling

[Hajras] But Israel still thinks that signing the treaty to prevent the proliferation of nuclear weapons does not serve its interests. Why then should we expect it to accept something that goes beyond that treaty, namely, making the area free of all weapons of mass destruction?

[al-Sa'idi] This question reminds me of an IAEA meeting which was held recently in Geneva. Israel was criticized at that meeting for refusing to sign the nuclear weapons nonproliferation treaty. To respond to that criticism the U.S. representative and the Israeli representative said that India, Pakistan, and Brazil had not signed the same treaty either and that Israel's preference was to hold direct talks with its neighbors before signing such a treaty. Mrs. Mirvat al-Tilawi, Egypt's ambassador, stood up to react to this response. She said that such statements to justify Israel's unwillingness to sign the treaty were absurd. She said the United States had approved the 1981 UN Security Council resolution which called upon Israel to sign the nuclear weapons nonproliferation treaty. "It makes no sense at all for the U.S. representative to be making justifications for Israel now. Not only do these justifications contradict the truth, but they also contradict previous U.S. resolutions." [She went on to add], "With regard to the excuse of direct talks which Israel's representative used, Egypt affirms that Arab countries have no objection to such talks if the representative of an independent Palestinian state can sit at the same negotiating table."

That was in fact a most eloquent and a most powerful reply. Neither the U.S. representative nor the Israeli representative was able to follow up with a single word.

Tilati Luluku

[Hajras] The idea of making a regional area free of nuclear weapons surfaced twice before: once in Latin America and a second time in the South Pacific region. The substantial rifts which emerged both times precluded the whole idea. Doesn't this mean that the idea of

getting nuclear weapons out of an entire region is an idealistic, nonfeasible idea? [passage omitted]

[Hajras] Are there other areas, which you think are likely to be promoted to become areas free of nuclear weapons and of weapons of mass destruction?

[al-Sa'idi] In addition to the Middle East, there is the Balkan area, and there is southeast Asia as well as Africa. In this regard I would like to remind you that Egypt has been supporting the idea of making Africa free of nuclear weapons for a long time.

[Hajras] In your opinion can a regional agreement be reached over a sensitive matter such as making an entire area free of weapons of mass destruction? Can such an agreement be reached without international guarantees?

[al-Sa'idi] Achieving a regional agreement is the goal, but a regional agreement cannot stand on its own without guarantees from the superpowers, including guarantees that the nuclear powers will not supply the countries of the region with nuclear weapons or nuclear materials. As far as our region is concerned, there is an additional, dangerous factor, namely, the strategic agreement between Israel and the United States. The United States, therefore, is directly involved in this matter.

This means that all the countries in question are involved in this matter. They are involved to ensure implementation of the agreement or to encourage its implementation. [passage omitted]

[Hajras] Can Egypt produce a nuclear bomb?

[al-Sa'idi] No. At no time did Egypt ever have non-peaceful intentions. In fact, it was one of the first countries to sign the nuclear weapons nonproliferation treaty. Egypt ratified that treaty in 1981 without making any preconditions, and this confirms its peaceful intentions. Every year since the seventies, the idea of making the area free of nuclear weapons has been approved by Egypt. Now, Mubarak's initiative confirms Egypt's peaceful intentions.

Nuclear Waste

[Hajras] Let's move away from nuclear weapons. We worry about the fact that Africa could become a nuclear waste dump for the advanced world. What do you think is the future of this matter?

[al-Sa'idi] This subject was brought up in an inappropriate setting, but bringing it up was very useful in revealing an attempt that some countries made to dispose illegally of their chemical, nonnuclear waste in African countries. When this matter was discovered, it was feared that this waste might be nuclear waste. Several steps were taken, and those steps included verification of the nature of this waste by IAEA representatives, who proved that this waste was nonnuclear. Also, in 1987 Egypt asked that an international agreement be reached to prevent the dumping of harmful waste in Africa. Egypt, which was then presiding over the African

group at IAEA, adopted a draft resolution to write an international protocol to prevent the illegal international shipping or transportation of such waste materials on the high seas for the purpose of burying them in developing countries in general. Such practices must not take place without sufficient guarantees that the waste materials were being shipped and transported with the knowledge of the exporting country, the importing country, and the transit country. There must be sufficient guarantees that these materials are being shipped in accordance with international conditions and that they are not harmful to people. A special committee was formed to draft that resolution, and I served on that committee, which completed drafting this international protocol last January. This protocol, which fully guarantees that such practices do not take place, will be presented to the General Assembly next September.

EGYPT

Atomic Energy Chief Discusses Peaceful Applications

90WP0098A Cairo AL-AHRAM in Arabic
22 May 90 p 3

[Article by Sayyid 'Ali: "35 Peaceful Nuclear Years in Egypt"]

[Text] This fall, Egypt celebrates the passage of 35 years since the beginning of nuclear activity in Egypt with the formation of the Atomic Energy Committee in 1955 and the Atomic Energy Agency in 1957.

On Thursday, 27 July 1961, the first continuous man-made nuclear fission on the African continent took place. At noon on that day, Egypt's first nuclear reactor began to operate for research and training. Criticality was reached at 2:45 pm in the Anshas reactor, a Soviet-built, two-megawatt reactor, operating on enriched fuel of 10 percent uranium 235, and cooled by light water.

Engineer Mahir Abazah, minister of electricity and energy, revealed that in its latest report the International Atomic Energy Agency [IAEA] praised Egypt's efforts in the field of the peaceful use of nuclear energy. The report gives important statistics on the agency's technical assistance to member countries during the 30 years between 1958 and 1988. Surprisingly, Egypt was the world's first country in terms of technical assistance received from the agency. In 30 years, Egypt has received \$18.7 million in aid: \$3.5 million for experts, \$10.5 million for equipment and scientific apparatus, \$3.8 million for fellowships and training courses, and \$1 million to fund research contracts.

The following countries followed Egypt in terms of assistance received: Brazil (\$12.7 million), Peru (\$11 million), Thailand (\$11 million), Yugoslavia (\$9 million), Hungary (\$9 million), Korea (\$8 million), Indonesia (\$8 million), Pakistan (\$8 million), and Bangladesh (7 million).

That is to say, Egypt presented carefully thought-out projects that enabled it to obtain this preeminent position in the international agency. The agency has regularly inspected nuclear installations in Egypt since Egypt signed the Nuclear Weapons Non-Proliferation Agreement in 1982.

Planned Peaceful Use

Dr. Fawzi Hammad, head of the Atomic Energy Agency, thinks that the agency's work has from the beginning been marked by concentration on peaceful uses. It was no accident that the agency's first activity in 1955 was to establish the National Radioactive Isotope Center, which began work in 1957. It was also no accident that the first of the laboratories built at Anshas was the Van de Graaff accelerator laboratory. This was the first accelerator on the African continent. It was followed by the construction in 1961 of the atomic reactor and a number of laboratories and buildings. The components of the first nuclear science center in Egypt—indeed, in the entire African continent—began to be completed. Widespread use of isotopes in agriculture, industry, and medicine was the fruit of these early efforts at peaceful uses of [nuclear] energy. Nuclear medicine (the use of radioactive materials in diagnosis) is considered to be a lofty achievement of nuclear energy in the service of humanity.

Dr. Hammad revealed that Egypt will finish building a radioactive waste treatment plant at the end of this year. This pioneering plant shows foresight, because the problem of radioactive wastes has emerged like the dilemma in a number of countries, including developed ones. This plant will support the safe use of radioactive materials. It will be sufficient to treat wastes generated from the widespread use of radioactive materials in Egypt for a long time to come—until the year 2020.

Dr. Hammad indicated that there are extensive facilities in Egypt for constructing reactors and manufacturing many parts of electricity generating plants, both traditional and nuclear. A committee called the Nuclear Manufacturing Committee includes representatives from all sectors of the country. Egypt, as everyone knows, has a competent scientific base in the peaceful areas of nuclear energy.

In the coming period, Egypt will expand cooperation with Africa in the area of peaceful energy uses, especially since Cairo was one of the founding capitals of the African Agreement on Cooperation in the Area of Peaceful Uses of Nuclear Energy, which five countries (Tunisia, Algeria, Ghana, Madagascar, and Egypt) have signed to date. The first meeting of this group will be held under IAEA auspices in Cairo this September. Hans Yalks, the agency's general director, will attend. The choice of Cairo as the site of the meeting by the member countries and the IAEA confirms the assessment of Egypt's role in the peaceful energy field.

The Egyptian Atomic Energy Agency is now establishing a countrywide radiation monitoring network for early

warning of any radioactive pollution coming from abroad after any nuclear accidents. Egypt has joined the Agreement on Early Warning and Aid in Nuclear Emergencies, which was approved by the IAEA in the wake of the Chernobyl accident.

Dr. Hammad states that the agency is working to finish this network within 1 and one and a half years at most.

The Atomic Energy Agency in Egypt seems unique. It provides important services to society, services that are necessary for modern technology and the uses of nuclear energy. Besides regulating and monitoring reactors, nuclear installations, and exposed radioactive materials, it conducts studies to measure natural background radiation in Egypt. It develops computational models related to the spread of pollutants, both radioactive and nonradioactive. It supports the agency's radioactive analysis laboratories. It uses regulatory methods to reduce accidents and possible dangers from nuclear installations and reactors.

Combatting Insects With the Atom

Dr. Hammad explained that in the field of peaceful energy use, we recommend the use of nuclear means in agriculture, particularly in combatting insects, for no progress can be made in this area without the use of nuclear means. He said, "We have before us long international experience in this area. The method of sterilizing insects by nuclear means has achieved splendid results in eradicating many kinds of insects in different areas of the world and has saved billion of dollars. The screw worm was first eradicated in 1954 on the Dutch island of Curacao. It was finally eradicated in the southeastern United States between 1958 and 1959, and since 1981 the pest has disappeared from the southwestern United States. It has been eradicated from northern Mexico since 1985. The Mediterranean fruit fly was eradicated in Mexico and many areas of northern Guatemala in 1982, and the tsetse fly was finally eradicated in a large area of Nigeria."

Food Irradiation

Also worth noting is the fact that the Atomic Energy Agency early began to use irradiation to sterilize products. It established a radioactive isotopes center that became a Middle East center for radioactive isotopes for the Arab countries. As it developed, a center for nuclear regulation and safety was established, and this center, in cooperation with the IAEA, the United States, and West Germany, has implemented training programs in all aspects of nuclear safety, including site selection for nuclear installations, environmental factors, radiation protection, fire prevention, and the safety of fully enclosed sources. These activities show that the Atomic Energy Agency has moved in the following directions:

- Personnel development and training in the areas of peaceful use of nuclear energy, and creating a scientific base in these areas.

- Spreading the use of radioactive isotopes in agriculture, medicine, industry, and medical sterilization.
- Work in the area of the nuclear fuel cycle and reactors, and early interest in nuclear power projects.

Atom Serves Society

Explaining the agency's peaceful activities to serve society in industry, agriculture, medicine, and environmental protection, Dr. Fawzi Hammad, head of the Egyptian Atomic Energy Agency, said, "We introduced cobalt units in 1963. In 1979, the mega-gamma Egypt-1 cobalt unit for medical product sterilization and food preservation against hot-weather spoilage began to operate. This eliminates much spoilage, microbe contamination, and insects. In some developing African countries there is a loss of almost 50 percent because of hot weather.

The agency has also built a laboratory equipped to use radioactive isotopes in agriculture. Means have been invented to deal with causes of low productivity and low tropical disease resistance in imported European livestock. A relation has in fact been discovered between the heat tolerance coefficient and the growth rate and has been named the "Kamal coefficient," after the Egyptian scientist who discovered it. The Kamal coefficient can be used to select heat-tolerant livestock. An integrated experimental farm is now being established in Anshas to apply all means of improving agricultural production over broad stretches of desert, combat pests, and experiment with new advances, in addition to the use of Rabij soil improvement invented by Dr Rida 'Azzam.

Dr. Fawzi Hammad added that the production of radioactive isotopes has recently been improved and modified. In addition to the following isotopes being produced in the laboratory—sodium 24, phosphorus 24 [as in source], potassium 42, and iodine 131—preparations are under way to introduce generators of molybdenum 99 and technetium 99. Also being prepared are chambers to measure resistance to radiation, as well as hormone analyses.

Nuclear Medicine

He pointed out that most Egyptian hospitals contain nuclear medicine units and facilities for diagnosis and treatment using radioactive materials. Accelerators are to be found at a number of hospitals. At the 'Ayn Shams medical faculty there is an 18-million electron volt linear accelerator. Study is now under way to manufacture simply designed and operated cobalt 60 treatment machines for wide-scale use in Egypt.

Isotopes have long been used in hydrologic studies in various areas of Egypt. Using this method, important information can be provided about ground water sources, so that they can be exploited.

Dr. Fawzi Hammad said that the agency's activity extends to the nuclear fuel cycle—discovery, planning, extraction, purification, and manufacturing of nuclear

fuel at a level above that of the laboratory, and also radioactive waste treatment. Projects currently exist for extracting uranium from phosphate, exploiting black sands, and finishing the construction of test mines for the extraction of uranium from the eastern desert.

Dr. Fawzi Hammad revealed that work is currently proceeding on setting a new policy for the operation of Egypt's first research reactor, following its modernization with IAEA technical assistance. A complete evaluation of the aspects of nuclear safety is now under way. Bids for building Egypt's second research reactor (20-30 megavolts) are now being analyzed. A new project is under consideration to design and construct a small research reactor for training purposes at the Egyptian universities by private efforts.

There is a nucleus for manufacturing radiation meters by modern methods, as well as other nuclear measurement devices, radiation treatment machines, etc.

Thus, the planned peaceful use of nuclear energy can lead to greater development and economic progress in the areas of manufacturing, agriculture, and medicine and to development of the use of uranium and power generation.

I asked Dr. Fawzi Hammad about the safeguards that can be provided for the construction of nuclear power plants.

He said that nuclear-generated electrical power plays an important role in satisfying the electricity needs of many countries. In some countries, such as France, Belgium, Japan, and Sweden, more than 50 percent of electrical power is generated from nuclear sources.

He added that many developing countries have accomplished tremendous achievements in the field of power reactors. For example, Korea generates 50 percent of its electricity from nuclear sources—also China, Taiwan, and India, which are building their reactors in the context of a policy of self-reliance.

Natural Gas

He said: As for safety, modern technology carries dangers with it. Electricity cannot be generated with dangers, even from coal and oil. What determines the use of a source is the extent of the need for it and the extent of available natural resources. The dangers can be minimized by preparation, training, good legislation, establishing a powerful agency for nuclear regulation and safety, and spreading nuclear safety education. The important thing is that there should be a variety of sources. The use of natural gas should be extended. He called for study of the economics of building Arab natural gas lines, either from the Gulf or from North Africa.

INDIA

Research Chief on Nuclear Capabilities

51500134A Calcutta THE STATESMAN in English
12 May 90 p 3

[Unattributed article: "India Can Produce 10,000 MW N-Power"]

[Text] If there are no resource constraints, India would be producing 10,000 MW of nuclear power at the turn of the century, Mr R. Chidambaram, the director of Bhabha Atomic Research Centre in Trombay, said in Calcutta on Thursday. Talking informally with reporters at the Saha Institute of Nuclear Physics, the atomic scientist said that raw material and technology would not be any problem. India had enough uranium deposit to meet the requirements of the power stations and the technology available for producing heavy water or for reprocessing nuclear fuel was at an advanced stage.

Mr Chidambaram discounted Press reports that India was smuggling in heavy water from undisclosed countries. He said: "Why should we bring in only 15 tons of heavy water when to produce 600 MW of atomic power we needed nearly 600 tons of heavy water?" The country already had an installed capacity to produce nuclear power to about 1,700 MW. He felt that in the long run "we would have to opt for nuclear power despite the initial high costs as the coal resources would gradually be exhausted and even our hydel facilities were limited. Besides, our quality of coal was not conducive to power generation as it had a high ash content".

The scientist claimed that the country was way ahead of other Third World countries in nuclear technology. Even if South Korea was producing 6,000 MW of atomic power, its reactors and other machinery were mostly imported. He said there was nothing indigenous about Pakistan's nuclear programme. Even China had recently launched its nuclear programme for peaceful uses. BARC was presently providing help to Nuclear Power Corporation for research and development, he added.

He said the various research reactors in the country, including the sophisticated "Dhruba", were performing well. The vibration problems in Dhruba had been rectified and apart from research activities it was also engaged in isotope production. India was capable of producing nearly 100 different kinds of isotopes for agricultural, industrial and medicinal purposes. "Cobalt 60" isotopes for the treatment of cancer or iodine isotope for the treatment of thyroid diseases were being manufactured to a large extent. Phosphorous and sulphur isotopes were being produced to meet the needs of the agricultural sector.

Answering questions, Mr Chidambaram claimed that the type of disaster which occurred at Chernobyl was virtually impossible in India. He said that the Chernobyl mishap had occurred because safety rules were grossly violated. "It was as if they were trying to drive a car

without brakes," he commented. He said that in India only very mature scientists handled reactors and they had to go through a rigorous training process. He felt that the environmental concerns were exaggerated and said that even if there was a high price for decommissioning, an additional cess is being collected from those consuming nuclear power to meet the costs.

Mr Chidambaram was in Calcutta for his personal research work. He is studying the phenomenon of "Quasi Crystals" with a professor of the Saha Institute of Nuclear Physics, Mr Prasanta Sen, and one of the latter's students.

Breakthrough in Separating Plutonium From Spent Fuel

51500136A Madras THE HINDU in English 2 May 90
p 6

[Unattributed article: "BARC 'Breakthrough' in Separating Plutonium From Spent N-Fuel"]

[Text] New Delhi, May 1—Atomic scientists in Bombay claim to have made a "real breakthrough" in the technology for separating plutonium from spent nuclear fuel, and electrochemical process.

The electrochemical processes in the various stages of nuclear fuel reprocessing were extensively tried out at the reprocessing plant in Tarapur, according to the Bhabha Atomic Research Centre (BARC).

The new process can lead to simplification of reprocessing operations, improved performance and reduction in nuclear wastes, BARC said.

At present, the fuel reprocessing plants in Bombay and Tarapur are based on the conventional "purex" process based on solvent extraction method.

BARC said the electrochemical processes involved electrolytic reduction and stripping of plutonium, oxidation of plutonium and electrolytic dissolution of plutonium oxide.

Trials carried out in batches showed that the new process was very efficient in extracting plutonium from nuclear wastes—PTI

Atomic Energy Commission Head on Export of Nuclear Technology

51500133A Bombay THE TIMES OF INDIA
in English 14 May 90 p 7

[Unattributed article—"Export Nuclear Tech: Iyengar"]

[Text] New Delhi, May 13 (UNI)—Dr P. K. Iyengar, chairman of the atomic energy commission, says India should share its experience in nuclear energy technology with the less developed countries.

"I think this is very important for the future as India is the leader of this technology in this part of the world," he said in an interview of NUCLEAR INDIA.

"As far as sustained growth in nuclear energy is concerned, we must not only be self-sufficient, and we should also make an effort to export technological goods which are not sensitive from the point of view of non-proliferation, but are useful for the growth of nuclear industries around us," he said.

UN Delegate Rejects Pakistan Nuclear Proposal

51500135A Bombay THE TIMES OF INDIA
in English 10 May 90 p 9

[Unattributed article: "India Rejects Pak-N-Off"]

[Text] United Nations, May 9 (UNI)—Without directly referring to a Pakistani proposal, India has rejected "partial or selective" attempts at nuclear non-proliferation.

Addressing the United Nations disarmament commission yesterday, Indian delegate asked the nuclear powers—the United States, the Soviet Union, China, Britain and France—to take "the lead" towards establishing a world free of atom bombs.

Earlier, Pakistan renewed its readiness to accede to the nuclear non-proliferation treaty "simultaneously with India" and accept International Atomic Energy Agency safeguards "on our nuclear programme simultaneously with India."

Without specifically acknowledging Pakistan's proposals, India's UN envoy in Geneva, Mr I. S. Chadha, discarded notions that "horizontal non-proliferation" is "an answer to global security." Mr Chadha is currently in New York, attending the disarmament commission meetings.

The Indian delegate asserted that nuclear weapons "cannot be indispensable and desirable for a new countries, but unnecessary and an anathema" for others.

"The commitment to abolish weapons of mass destruction has to be a universal one and not partial or selective," he said, adding that "Horizontal non-proliferation has to be accompanied by vertical and spatial non-proliferation and the lead has to be taken by those possessing such weapons."

The Indian delegate rejected attempts to link nuclear and conventional disarmament, saying that such a move was sure to "distort" priorities set by the first special session on disarmament.

"This perception is necessary because a conventional war can also escalate into a nuclear war by the use of a single nuclear weapon. But a nuclear war cannot de-escalate into a conventional war, since there is no return from the abyss of a nuclear catastrophe."

Mr Chadha hailed advances on the INF and the START treaties, saying they were cause for optimism, but cautioned, "Let optimism not lead to euphoria."

"The nuclear arms race, set off by the Cold War, has left behind a trail of enormous nuclear arsenals amounting today to more than 55,000 warheads, which equal one million times the explosive power of the Hiroshima bomb.

"Until these arsenals are eliminated, the danger persists that an accident, a miscalculation, or an irrational act may cause a nuclear holocaust," he said.

On South Africa's nuclear capability, the Indian delegate asked the commission to tell the world about the threat the apartheid regime poses which "demands renewed urgency in our response."

On conventional disarmament, Mr Chadha stressed the special responsibility of states with the largest military arsenals. It was no "coincidence that the nuclear weapons states account for more than 70 per cent of the world's military expenditure," he said.

"The impulse for high military spending in a region derives in large part from local factors, from unresolved territorial disputes, denial of the right of self determination and other human rights, ambitions for hegemony, foreign occupation or military intervention," he said.

"This can only exacerbate tensions, increase the danger of war and conflict, and thereby condemn the state of the region to a vicious circle of ever increasing levels of forces and armaments and diminished security.

"State that are in a dominant military position in a particular region therefore bear a special responsibility to promote and initiate arms limitations and reductions," he said.

Outgoing General Discusses Nuclear Options

BK3006113090 Hong Kong AFP in English 1035 GMT
30 Jun 90

[Text] New Delhi, June 30 (AFP)—India would have no option but to possess nuclear weapons if a potentially hostile neighbour also acquired the bomb, India's outgoing army chief of staff said here Saturday [30 June]. In an obvious reference to Pakistan, currently believed to have or be on the verge of perfecting its own bomb, Chief of Army Staff General V. N. Sharma said in an interview on All India Radio that unless the Indian Armed Forces possessed such a capability, it would have no deterrent.

"A reply to a nuclear weapon capability of a potential hostile nation is to possess the same capability yourself," he said.

However he said the decision on whether or not to have "such weapons" was in the hands of "our people and the government" and not in the hands of the Armed Forces.

India exploded a nuclear device in 1974, but said then the capability would be used for strictly peaceful purposes.

Relations with Pakistan have deteriorated in the past four months over the issue of a secessionist movement in Indian-controlled Kashmir, with New Delhi accusing Islamabad of fuelling the campaign. Despite the two countries' Armed Forces commanders staying in touch by hot-line both sides are known to be conducting troop manoeuvres on their common border. The two countries have fought three wars since independence from Britain in 1947, two of them over Kashmir.

Without mentioning Pakistan by name, the general described the current geo-political climate as "tense" and predicted India would face what he described as some difficulties in the near future. The general also expressed his concern at the effects on the Indian Army's training and budget of being used in tackling internal law and order situations, saying he was in favor of setting up a U.S.-style national guard. He praised the present government's idea of trying to raise a force made up of ex-army officers and men saying it should reduce the number of times the army had to be called out within India's boundaries, but added that for "a few years to come" there was no option but to use the army.

Indian Army units are currently being used to tackle the virulent secessionist movement in Moslem-majority Kashmir and are frequently called out in the rest of the country when police and paramilitary fail to control communal riots or separatist outbreaks.

Gen. Sharma, who retired Saturday after 40 years of service in the Indian Army, the world's fourth largest, is to be replaced Sunday [1 July] by General S. F. Rodrigues, 56, currently chief of the army's strategic Western Command. Gen. Rodrigues' position in the Western Command is to be taken by Lieutenant General G.S. Grewal, a corps commander.

IRAQ

ABC's Diane Sawyer Interviews Saddam Husayn

JN3006130090 Baghdad INA in Arabic 0615 GMT
30 Jun 90

[Interview with President Saddam Husayn by ABC correspondent Diane Sawyer on 24 June; place not given]

[Excerpts] Baghdad, 30 Jun (INA)—[passage omitted]

[Sawyer] The latest thing Americans heard was an expression or a statement in which you said: By God, we will burn half of Israel if it tries to harm or attack Iraq, or any part of Iraq. We do not need a nuclear bomb. We possess the binary chemical. Whoever threatens us with nuclear weapons, we will destroy him with chemical weapons. The United States has described these words as unwise and inflammatory. Did you actually mean what you said?

[Husayn] We have learned some of this talk from U.S. presidents. If you ask me how, I will tell you. After the United States and the Soviet Union acquired nuclear weapons, successive U.S. presidents exchanged warnings with the Soviets saying: If you strike, we will destroy you. Both sides were, in a way, displaying their power in specific circumstances. Is this not correct?

[Sawyer] Yes.

[Husayn] We still say that war is crazy. We also say that wars result in tragedies, regardless of their circumstances and results. But we believe that wisdom also says that if you do not want to involve your enemy, you tell him what your reaction will be if he attacks you.

Therefore, we spoke when the Israeli generals were talking about the need to direct a preemptive strike at Iraq and when some people in the West were preparing the political and media grounds for such a strike. You can go back to the statements by certain Israelis and in some of the Western media about the need to direct strikes, perhaps with missiles, at certain scientific institutions that they say are producing chemical weapons. If this happened and Israel attacked—thinking that Iraq would not reply—what should we expect? War would break out and there would be counterstrikes. Is it better for us to prevent the destruction before it takes place or wait for the moment to use the weapons of destruction? We believe that in such a situation it is better to let all parties know in one way or another about the harm counterstrikes will do.

[Sawyer] But many people would be shocked when they hear such words from you.

[Husayn] This is because it is the first time they have heard such words from the Arabs. In the past, it was Israel that spoke about striking and then actually struck—without the world uttering a single word. Israel struck in Lebanon, Tunisia, and Iraq. Before that, it struck several Arab states. Did the Western media launch the campaign they are launching now against Iraq, which is only saying: If Israel attacks Iraq or the Arabs, we will attack it?

[Sawyer] Does what you are saying now mean that in any conflict between Israel and any Arab side you will use chemical weapons?

[Husayn] What I clearly said is as follows: If Israel attacks Iraq or the Arabs, we will attack it. If it thinks it can use the atomic weapons in its possession, then it must know that Iraq possesses the binary chemical weapon, which is capable of doing it great harm.

[Sawyer] This is very important and I would like it to be clear. What you are saying is that you will side with any Arab country in a military conflict with Israel, but only when Israel threatens to use the nuclear weapon. Your reply then would be to use the chemical weapon; in other words, when there is a direct threat from Israel to use the nuclear weapon.

[Husayn] Exactly. This was what we said. It was in plain language. Politicians in the West have also understood it. But some tendentious people have taken the first part or half of the statement out of context and have said that Saddam Husayn threatened to burn half of Israel. They did not also mention that I said: If Israel attacks the Arabs or Iraq, Iraq will reply. And, that if it used or threatened to use [nuclear weapons], then it must remember that Iraq possesses the binary chemical weapon. Incidentally, the gas masks Israel is distributing are useless. You know that masks are useless against certain types of chemical weapons. You notice how we are enumerating our capabilities. Israel does not do the same, because it actually wants war. We, on the other hand, are giving warning because we do not want destruction or any harm to come to mankind.

[Sawyer] You say these masks are useless. Then they would be deluding themselves if they put them on to protect themselves against these weapons?

[Husayn] We believe peace is the only way. Taking practical steps toward peace is the wise and sound way to deal with developments, apart from recognizing the Palestinian people's rights; ridding the region of mass-destruction weapons—whether chemical, nuclear, or biological; and creating an atmosphere of peace. When the countries in the region have created an atmosphere of peace, there will no longer be a need to stockpile weapons, not even conventional weapons.

Therefore, when we have weapons, we have them to defend ourselves and not to attack anyone.

[Sawyer] I wanted to move on to the subject of the PLO, but there is a point I wish to clarify. Could any of your military leaders decide to use chemical weapons, or is the decision entirely in your hands?

[Husayn] In the case where Israel uses atomic or chemical weapons, then yes. The duties are clear and equal regardless of whether the order is issued by a missile base or an airbase. When it is known that Israel has used atomic or chemical weapons, then they must direct them to Israel. [passage omitted]

[Sawyer] Regarding nuclear weapons, Mr. President. I know you have signed an agreement on nonproliferation of nuclear weapons and that Israel has not signed that agreement.

[Husayn] Why do the mass media not concentrate on this? Why do they not say to Israel: You are a small entity, and the basis of your security lies in peace, not in attempts to acquire mass-destruction weapons?

[Sawyer] The reason may be that the Americans believe that Iraq wants to acquire nuclear weapons.

[Husayn] Is it logical to assume, for democratic purposes, that we have to wait until Iraq, Egypt, Syria, or Tunisia possesses the atomic bomb in order to correct matters in the following way: By having an equal number of atomic bombs as Israel? Is this better? Would it not

have been better to prevent Israel from acquiring chemical, biological, and nuclear weapons?

I believe it was illogical to allow Israel to have these weapons, because Israel usurped Arab rights using conventional weapons. It did not possess chemical, biological, or nuclear weapons to defend itself. Therefore, it is Israel that tempted the Arabs to acquire chemical weapons after it had acquired these weapons along with nuclear weapons.

[Sawyer] Let us say, in theory and for the sake of argument, that Iraq wants nuclear weapons and it wants to acquire nuclear weapons. How long would it take to acquire a nuclear weapon, two or five years?

[Husayn] You in the United States have defined a certain period of time for Iraq or others to acquire nuclear weapons.

[Sawyer] Of course, the United States and U.S. officials have said that Iraq was busy going around the world in search of nuclear weapon technology. As you know, there are legal cases pending in the United States on smuggling capacitors for these purposes.

[Husayn] But we bought them on the U.S. market in accordance with the law.

[Sawyer] Americans think the approach was wrong and illegal, because you bought the capacitors through a company dealing with foodstuffs and that the containers of these capacitors were shipped in refrigerators. Americans have also read in newspapers that the head of the company said the devices were designed especially for nuclear weapons and not for laser research or any other scientific purpose.

[Husayn] I will make a brief comment on this. I am saying that we imported capacitors from the United States for the purposes explained and spelled out in a statement by a Foreign Ministry official spokesman before the importation of these capacitors, which you said were shipped in a certain manner—in the manner you just explained. These capacitors had the same specifications as other capacitors. If the party that showed a lack of good faith also insinuated in a certain way that Iraq wanted the capacitors for purposes other than that for which they were originally imported, then we cannot be held responsible. We are responsible for the contract that shows the specifications of the goods. All the contracts through which we imported U.S. capacitors show that the capacitors would be used for purposes other than nuclear detonation. All U.S. and West European politicians who make accurate statements have not said that Iraq possesses nuclear weapons; and this is a true representation of the facts. Chemical and nuclear weapons are not conventional weapons. You were the first to possess them. Besides, you also know how sophisticated these weapons are. What would the situation be if this or that country were able to take this step and produce nuclear bombs? If we were in possession of the nuclear bomb, we

might facilitate peace and the destruction of mass-destruction weapons, and thus help people to live in security. If the United States were to lend us some [nuclear] weapons, it might facilitate peace in the Middle East.

[Sawyer] I do not believe that they would agree with Your Excellency on this.

[Husayn] Then, let them destroy the weapons of mass destruction in the Middle East if they truly want peace. Let the United States convince Israel to destroy weapons of mass destruction, make peace with the Palestinians, and consequently end its current role.

[Sawyer] The Americans are always saying: Who is Iraq trying to fool? It is cooperating with Chile and other countries such as France in this regard. Even though you might not possess this weapon, you are persistently seeking to acquire it. Some Americans are saying: Why do you not acknowledge this, since you are seeking to obtain the technology for this weapon?

[Husayn] I would answer you by saying that this question and concern must be addressed to Israel, because Iraq's quest for obtaining this weapon is based on assumptions rather than information. As for Israel's acquisition of nuclear bombs and chemical weapons, this is accurate information and substantiated facts. Hence, can this nebulous question and concern be addressed to the party that is supposedly seeking to obtain this weapon? Should not this question be addressed to the party that is actually in possession of the weapon? Or do the U.S. people think that what is permissible for Israel is off limits for the Arabs? If the U.S. people make this mistake, it would mean they are racists who differentiate among peoples according to ethnic origins and religious affiliations.

[Sawyer] But, we are asking you, Mr. President. Is this assumption true?

[Husayn] I say clearly that Iraq does not possess nuclear weapons.

[Sawyer] Is Iraq trying to obtain nuclear technology?

[Husayn] I will not answer this. But I also say clearly that it is the right of any nation or people to defend itself and its independence. It is not the right of any nation or people to hold humanity in contempt, but to behave responsibly. It is also the right of any nation or people to possess the weapons with which to face the enemy when it possesses a certain kind of weapon.

[Sawyer] I notice that His Excellency the President has not answered my hypothetical question on how long it would take Iraq to acquire this weapon. I am trying to get an answer once again.

[Husayn] If we had a program, we would have said clearly how much time we needed to acquire this or that

weapon. We believe now that the binary chemical weapon is sufficient to fight the Israeli atomic bomb. [passage omitted]

PAKISTAN

Tritium Transfer to Nuclear Weapons Program Detailed

90WP0104A Paris *POLITIS-LE CITOYEN* in French
22-28 Feb 90 pp 50-55

[Article by Mycle Schneider: "Paris: Hub for Pakistani Nuclear Traffic"]

[Text] Nuclear matters were discussed a great deal these last few days in Pakistan, in connection with Francois Mitterrand's official visit. In addition to a power plant, Islamabad wanted a friendly resolution of the long-disputed contract for a reprocessing plant, which France broke in 1979 under pressure from the United States. The reason given at the time: concern about nonproliferation of nuclear weapons. Since that time, Pakistan has apparently succeeded in building an atomic bomb, bypassing embargoes on the materials and components necessary to its production, such as tritium and zircalloy... On 12 January West German police arrested a certain Mr. Ortmayer and four of his accomplices who allegedly helped the Pakistanis get around international laws. The nerve center of the operation: the Pakistani Embassy in Paris, and more precisely Dr. Hassibullah, chief of its technology and science section...

Altenhasslau is a small German village near Gelnhausen, in Hesse. A certain cab driver takes a day's leave, but not to take a stroll in the park nearby or to sunbathe in his yard. His mission is one that must be carried out in absolute secrecy. He will not take any passengers.

He drives to Gelnhausen, to the home of Rudolph Maximilian Ortmayer, his employer for the day, receives an envelope from him, and starts off again immediately. His itinerary is longer than usual. After two hours he arrives in the capital. The addressee in Bonn is contacted: It is Dr. Abdul Wahid, the Pakistani ambassador himself. The latter opens the envelope and sends a second envelope inside it by diplomatic courier to Paris. The recipient, Dr. Hassibullah, attached to the technology and science section of the Pakistani Embassy in Paris, waits impatiently for the letter. A lot is at stake. Hassibullah and his section are responsible for organizing clandestine acquisition throughout Europe of materials and components for the nuclear facilities that will enable Pakistan to perfect the ultimate weapon, an atomic bomb.

It all began in 1974, with the "peaceful" detonation of India's first nuclear bomb. In neighboring Pakistan, then Prime Minister Zulfikar Ali Bhutto, Benadir's father, launched an ambitious program to narrow the nuclear weaponry gap. In October 1974, scarcely six months after the Indian nuclear test, SGN (then Saint Gobain

Nucleaire, today General Company for New Technologies) signed a contract to build Pakistan a reprocessing plant. Reprocessing consists of separating plutonium—the highest-grade raw material for an atomic weapon—from spent nuclear fuel. The plant never got past the laboratory stage. In 1979 the French Government bowed to U.S. diplomatic pressure and the nuclear weapons nonproliferation policy (see below): It abandoned the project. Legal acquisition of the technology was completely blocked.

So Pakistan set about exploring other ways to get the materials needed to fabricate the bomb. Along with an American research reactor and a Canadian nuclear power plant, both under international controls, Ali Bhutto established a large research center. Pakistani scientists went for training in all the countries with nuclear programs: the United States, France, the FRG, Belgium, the Netherlands....

In 1975 Dr. Abdul Qadeer Khan fled the Netherlands, taking with him the ultrasecret plans for a uranium enrichment plant. There are two ways of making an atomic bomb: plutonium (Nagasaki) or highly enriched uranium (Hiroshima). Dr. Khan is now considered the head of Pakistan's military program. But plans alone were not enough. The project required very sophisticated materials and facilities. The personnel of the Pakistan Atomic Energy Commission (PAEC) built up a fantastic network of clandestine suppliers around the world. And the hub of the traffic was to be the Pakistani Embassy in Paris.

Sixty-Two Truckloads

Engineer Albrecht Migule of Freiberg, West Germany, receives an order for a long list of parts. He buys a little here, a little there, and sends entire caravans of equipment to Pakistan: 62 truckloads in all. The value of the equipment: about Fr 50 million. In April 1980, at Multan in the middle of the Pakistani desert, a new facility was opened. Its purpose: conversion of uranium into UF₆, a critical pre-enrichment operation. Migule was arrested five years later, receiving an eight-month prison sentence and a Fr 100,000 fine.

The Leybold and Heraeus Company at Hanau, in Hesse, gets an order for equipment needed to load and unload uranium fuel destined for enrichment. Leybold and Heraeus delivers the parts to its subsidiary in France, Leybold and Heraeus Sogev, in which Thomson-Brandt owns a 32-percent interest and which operates a plant at Bourg-les-Valence, where the parts are assembled. Next, as German intelligence agencies report in a memo to the minister of economic affairs dated 12 January 1984, "the supply route goes from Valence to Paris and from there, via Air France, to Dubai and on to Pakistan."

But the top agent involved in this traffic, the "businessman" for the network, was Rudolph Maximilian Ort-mayer, the head of NTG (Neue Technologien GmbH). Ort-mayer was the key figure in efforts by the Pakistani Embassy in Paris to achieve its objectives. In the spring

of 1987, Ort-mayer's news was particularly encouraging: He had made all the arrangements to deliver a significant quantity of tritium, as well as all the equipment needed to separate and enrich this tritium. Delivery would take place before the year's end. The ambassador in Paris expressed his satisfaction in a letter sent by secure channels to another address. For some time, Ort-mayer had preferred that correspondence no longer be routed through his company. He received the courier from Paris at his own home, at the home of his secretary, Madame Reuter, or sometimes at his mother-in-law's place. Hassibullah paid the agreed-upon sum, as usual, without delay.

Hassibullah's section of the embassy in Paris had a special account with the Frankfurt subsidiary of the National Bank of Pakistan which it used for this type of expense. Black-market transactions of this kind are expensive, very expensive. As early as 1980, the German clandestine agency BND [Federal Intelligence Service] identified the source of the funds, in a report to the chancellor dated 4 July which has been reported in the German magazine STERN. Libya had allegedly offered to finance the Pakistani project, "on condition that Pakistan train Libyan personnel as part of the program. Pakistan took on 18 Libyans: Libya made \$100 million available."

On the account books of the National Bank of Pakistan in Frankfurt, German investigators found that Fr 350 million in questionable transfers had been made to some 50 West German companies. "In these entries we do not find any Pakistani companies appearing as clients. Instead, as in many cases where we know the client did not want to be exposed, we find the embassy in Paris," explains the public prosecutor of Hanau, Reinhard Hubner. And specifically "the division that interests us," the technology and science section. The embassy in Bonn played the role of a mail drop. "When important matters were at stake, personal contacts were made with the Pakistani Embassy in Paris," adds Hubner.

Efficiency Factor

For a long time the top dog, the "main buyer," was a certain Mr. Butt, one of the directors of the PAEC, a Pakistani army officer well-known to the intelligence services under the name "Mister Fish." In 1985, Butt changed his name. One of his men was caught red-handed by the CIA. Butt was henceforth called Dr. Shef. Some time later Butt or Shef was replaced at the embassy in Paris by Mr. Hassibullah, who from then on was the man calling the shots.

It was he who gave the orders, arranged the logistics, handled transfers of funds. It was then up to Ort-mayer to acquire the materials. As for the tritium...

Tritium is one of the isotopes of hydrogen (H₃ or T), unstable and radioactive. It is used, in very small quantities on the order of several milligrams, as a source of luminescence for emergency exits, road signs, watches, etc. In fission bombs, tritium serves as an amplifier,

facilitating miniaturization and augmenting precision. In fusion bombs (H-bombs), it is indispensable. According to the Nuclear Control Institute of Washington, "tritium is the key to compact and effective design in modern nuclear weapons." To limit the risk of proliferation, American regulations require special authorization for the export of tritium in amounts greater than one milligram per object! Today almost all tritium is produced in countries that have nuclear weapons. France produces it in the Celestin-1 and Celestin-2 reactors at the Marcoule military facility in Gard.

The tritium used in bombs must be replenished frequently, since it decays so rapidly (5.5 percent per year) into helium. Its half-life, the time it takes to lose half its radioactivity, is 12.3 years. This characteristic led the Nuclear Control Institute to propose the "tritium factor" as a sort of "natural disarmament." In April 1988 the United States was forced to close its producing reactors at Savannah River for safety reasons. The Nuclear Control Institute proposed, as an alternative to resuming production, that weapons levels be reduced as tritium stocks decline. Since production at Savannah River stopped, the price of tritium has more than doubled. On the black market, prices began to skyrocket.

Urgent Entreaties

In 1985, Radium Chemie AG, a company based in Teufen, Saint-Gall, in Switzerland, acquired a tritium facility from the Nuclear Research Center of Jülich, near Cologne. A heavy-water research reactor produces tritium as a by-product. Before being transported to Switzerland, the tritium is sent to the Grenoble Nuclear Research Center (CENG), where it is purified. According to an investigative report by the Swiss weekly *SONNTAGSZEITUNG*, three containers with a total of 7.9 grams of tritium were delivered to Teufen. Most of it was used to make luminescent paint, but 0.3 gram of military-grade tritium, 95-percent pure, was sold to a frequent client, the Gutekunst Leuchtfarben company based in Villingen-Schwenningen, West Germany. In 1987, Gutekunst ordered more tritium. Radium Chemie sent it 0.5 gram remaining from a 1980 Soviet delivery. Responding to Pakistan's urgent entreaties, Ortmayr made contact with Gutekunst and secured the delivery of 0.8 gram of tritium.

There remained the task of getting the tritium to Pakistan. With the help of the forwarding agent, Mr. Crost, Ortmayr and his contacts devised an ingenious solution. They applied to the West German authorities for permission to export it to Hong Kong, to a factory that manufactures luminescent paint for watches. The authorization was granted. In reality, the containers shipped there were empty. At the same time, Gutekunst sent the tritium to Pakistan in containers falsely declared to be empty.

The trickery employed by the traffickers to deliver an entire system for the purification and enrichment of tritium—a process called TROC (Tritium Removal with

Organic Compounds)—was also something right out of detective fiction. First of all, it was necessary to find qualified technicians. Ortmayr therefore put on his payroll about ten individuals employed with well-known research centers and companies such as Degussa and RBU in Hanau, or Metallgesellschaft in Frankfurt. Most of the time these technicians topped off their monthly salaries without the knowledge of their employers. For example, since 1981 Ortmayr paid DM1,000 (about Fr 3,400) per month to a certain Weichselgartner, director of the tritium laboratory of the Max Planck Institute for Plasma Physics (IPP) located in southern West Germany, for consultant services. It was he who "arranged the deal with the 0.8 gram of tritium," as he himself describes it. IPP's personnel director, Dr. Duisburg, was also in the know, because in 1986 Weichselgartner became a part-time employee. Duisburg advised him to set up a company in his wife's name in order to profit from the wholesaler's discount for equipment acquired for Ortmayr. No sooner said than done.

The new enterprise, CTB (Chemisch-Technische-Beratung), was not the only phantom company. Ortmayr took pains to keep his "real" company, NTG, from coming to the authorities' attention. To cover his tracks, he established another company called PTB (Physikalische-Technische Beratung) to serve as an intermediary in forwarding deliveries to Pakistan. A third man, physicist Peter Finke, completed Ortmayr's core team.

In the meantime, the CIA had not been sitting on its hands. On 13 March 1986 the U.S. State Department delivered what is called a "nonpaper," a document bearing no letterhead or signature, to its West German counterpart. The document said that a certain firm, Linde AG of Munich, had been identified as a possible supplier of the TROC. Linde confirmed its contacts with Ortmayr. The Americans were quite upset about this. So upset that on 24 April 1986 they managed to get TROC-type systems added to the COCOM (Coordinating Committee for Multilateral Strategic Export Controls) list restricting the export of sensitive materials from the industrialized Western countries to countries considered "at risk," notably the Soviet Bloc. The new COCOM accord went into effect on 5 November 1986, but its provisions were not incorporated into German law until 25 March 1988.

Evasive Responses

Certain offices in the German Ministry of Economic Affairs played a questionable role, to say the least, in all this nuclear trafficking. They did not seem to be impressed by the American fears. In an internal memorandum of 21 December 1988, the Ministry of Foreign Affairs in Bonn complained that five letters and numerous telephone calls between March 1986 and June 1988 elicited only "evasive or insufficient" responses. The economic ministry reportedly marked the case closed as soon as Ortmayr advised that the project had been abandoned for financial reasons. "Since then, we

have not pursued the project," he assured the ministry. The truth was exactly the opposite. In fact, the Ort-mayer-Weichselgartner-Finke trio concluded the deal with the Pakistani Embassy in Paris. Ort-mayer negotiated the price (probably DM3 million, or more than Fr 10 million), Weichselgartner designed the equipment, and Finke went to Pakistan to help out with construction. The materials were purchased by CTB, resold on paper, and shipped by the other phantom company, PTB. The airplane took off from Frankfurt on 31 May 1987, and the TROC—declared as a "waste handling system"—was on its way to Kahouta, a nuclear site 150 km south of Rawalpindi where Pakistan has established its "parallel" nuclear program, under the permanent protection of anti-aircraft batteries meant to deter an Indian attack. Finke, who went there himself to get the plant in operation, understood perfectly the real purpose of the installation: "Clearly, the fabrication of bombs."

Ignorance

Theoretically, it can produce five to 10 grams of pure tritium per day. That is an enormous amount, considering the very small quantity necessary for each bomb (from a few milligrams up to several grams). A year after the plant went into operation, the Pakistanis still feigned ignorance. Thus Saiyid Zaidi, director of the PAEC, stated in the specialized bulletin NUCLEAR FUEL: "I do not even know what a tritium purification unit is."

As one can see, the European network was a smooth operation. For years, the Pakistani Embassy in Paris continued to pass orders to Ort-mayer, who employed all manner of wiles to fill them promptly. Many companies have been implicated, in Germany as well as in France. And that only covers the tritium.... The French firm Pechiney, for example, shipped supplies of zircalloy quite illegally to prohibited destinations (see below). It was not until 10 January 1990 that Ort-mayer was finally arrested and his network dismantled. But it is probably too late. The operation has already borne fruit. In 1986 the head of the program, A.Q. Khan, announced that Pakistan had the capability to enrich uranium. Zia ul-Haq then told the HERALD TRIBUNE: "You can write that Pakistan is capable of building the bomb whenever it wants. Once the technology is acquired, you do what you want: utilization for peaceful or military ends." On 18 November 1987, at a meeting of the nonproliferation working group of European Political Cooperation [CPE], the foreign policy arm of the European Community, the British representative declared himself convinced that Pakistan has "a few small" nuclear weapons and said intelligence had confirmed it. As for India, it was reportedly able to produce them on two weeks' notice, if it had not done so already. The American magazine U.S. NEWS AND WORLD REPORT said the same month that Pakistan had an arsenal of six uranium-based nuclear bombs and was starting work on plutonium bombs. A.Q. Khan told an Indian journalist three years ago: "It must be clearly understood that we will use the bomb if our existence is

threatened." On 5 February a serious military confrontation erupted all along the Kashmir frontier. It is only one step from there to a "threat to one's existence."

Pechiney Supplies Islamabad From 1984 to 1988

Tritium was not the only critical element Pakistan sought in its quest for the bomb.... Since the establishment of its military nuclear program, obtaining zircalloy has also been a problem. Zircalloy is a unique zirconium-based metal used for the fabrication of fuel sheaths. It is thus basically for the operation of a nuclear reactor. Here again, Pakistan availed itself of the Ort-mayer network, which kept supplies coming from 1983 to 1988. Initially, Ort-mayer bought the zirconium from India's National Fuels Company and shipped it to the FRG for delivery to the supplier's traditional enemy. But the Pakistanis, adding insult to injury, complained of the poor quality of the Indian zirconium. Ort-mayer had to find another supplier. He made contact with Pechiney representatives in the FRG. Pechiney has two specialized subsidiaries: Cezus, a wholly-owned subsidiary, which produces zirconium, and Zircotube (owned 51 percent by Pechiney and 49 percent by Framatome), which produces zircalloy tubes. Cezus and Zircotube accepted Ort-mayer's offer.

Then another person entered the scene. Mr. Wellensieck was the Karachi representative of a Hamburg-based company, Rieckermann. He also played ball with Ort-mayer's Pakistan schemes. Wellensieck invented another company, Switzerland-based MVG (Metall-Vertriebs-Gesellschaft) to take part in the hide-and-seek game. MVG did not really exist. Wellensieck had letter-head stationery bearing a fictitious address printed for it in the FRG. The deal worked this way: NTG bought material from the two French companies, then resold it on paper to PTB, which in turn transferred it to MVG, which, as we have pointed out, did not exist. Physically, the material was sent to Frankfurt, where the labelling was altered. The zirconium became "special steel," and the destination became Pakistan. There was no export authorization.

In 1985, Quai d'Orsay finally focused on the fact that although the FRG had no heavy-water reactors it was receiving a great quantity of the zircalloy tubes used in that kind of reactor. Export authorizations were suspended, and Cezus was asked what country was the real destination of the deliveries.

The subsequent events have been related by Reinhard Hubner, the public prosecutor of Hanau, who testified as follows in closed session before members of the investigating committee of the German parliament: "In close consultation, representatives of Pechiney and Mr. Ort-mayer agreed to name India, rather than Pakistan, as the destination country. Which they did, claiming that India insisted on secrecy in order to protect its position on the world market." The French "regulators" were content with that explanation, and exports were permitted to continue. At the same time, however, Quai d'Orsay passed the information to its counterpart in Bonn. The

German officials were not satisfied with these explanations and requested that the economic ministry monitor the exports shipped out by Ortmayer's NTG. Functionaries at the ministry cooperated to this extent: One of them immediately called Ortmayer on the telephone to read him the demand from the Ministry of Foreign Affairs. The investigation was choked off at its inception.

So Ortmayer was able to continue making deliveries. Through the summer of 1988, he succeeded in transferring illegally to Pakistan probably more than 30 tons of zirconium and zircalloy tubes...from France.

FRG Foreign Ministry Document

Report by the West German Ministry of Foreign Affairs on the 18 November 1987 meeting of the working group on nonproliferation of the policy committee of the CPE: Great Britain expressed its serious concern about the Indian subcontinent. Its representative declared himself convinced that Pakistan is in possession of "a few small" nuclear weapons, information which was confirmed by British intelligence. India, for its part, according to the same document, has the capacity to produce nuclear weapons on two weeks' notice, if it has not done so already.

[Translation of German text of document described as first page of FRG Foreign Ministry document]

Re: Meeting 18-19 November 1987 in Brussels of European Political Cooperation nonproliferation working group

Here: India/Pakistan

1. GB [the British representative] expressed his deep concern about the situation on the Indian subcontinent ("five minutes before 12"). In a bilateral meeting before the session, he said he was convinced that Pakistan had "a few small" nuclear weapons and that the British Secret Service confirmed this.

India, if it does not already possess nuclear weapons, would be able to manufacture them within 14 days.

2. During the session, GB described a resolution which is before the U.S. Congress, stipulating that the United States will cut off its financial aid for Pakistan because of the Pakistani nuclear program. He stated that American Ambassador Kennedy had told him the Pakistanis had broken their promise to the United States not to enrich uranium more than five percent.

3. B [the Belgian representative] raised the question of why Pakistan was building a reprocessing plant and what was the source of the irradiated material, if one assumed that all Pakistani plants are under safeguards. National [illegible] could, in her opinion, be an explanation—if an improbable one. The irradiated material could also come from other countries, or the safeguard....

Nuclear Non-Proliferation Pact Proposed

BK0807162390 Hong Kong AFP in English 1551 GMT
8 Jul 90

[Text] Islamabad, July 8 (AFP)—Pakistan called Sunday for implementing a nuclear non-proliferation pact in South Asia amid growing international concern that India and Pakistan might use atomic weapons in a war on Kashmir.

Foreign Secretary Tanvir Ahmed Khan said he was ready to discuss the issue with his Indian counterpart, Muchkund Dubey, who arrives here on July 17 for two days of talks on de-escalating tensions over the Kashmir dispute.

Troops of the two hostile neighbours have massed along their border in the wake of an uprising in the Indian-administered sector of disputed Kashmir, over which India and Pakistan have fought two of their three wars.

U.S. Senator Alan Cranston this week expressed fears after visiting India and Pakistan that if another war broke out it would develop into a nuclear exchange.

But Mr. Khan said he did not think "there is such a danger now."

He said Pakistan hoped that "long before such a danger arises," India and Pakistan would be able to reach a nuclear non-proliferation agreement.

"The international concern makes it more urgent that we develop a regime in South Asia which brings confidence that there will be no danger of a nuclear holocaust even in the distant future," he said.

He said Pakistan had made several proposals and added he would "be very happy to discuss them with the Indian foreign secretary."

Mr. Khan spoke as Indian Foreign Minister Inder Kumar Gujral renewed allegations that Pakistan was "supporting, financing and training" militants waging secessionist campaigns in Indian Punjab and Kashmir.

The Pakistani foreign secretary rejected the charges, saying, "We have denied it in the past and we deny it again."

"No outside power can bring to the streets hundreds of thousands of people Friday after Friday and day after day," he said referring to frequent pro-separatist rallies in Srinagar, hub of the Moslem movement and summer capital of Indian Kashmir.

Mr. Khan said India had intensified its repression in Kashmir Thursday when it gave security forces within the state wide-ranging powers to put down the separatist campaign.

"Granting extreme power to a security force which has already earned extreme odium to shoot without commanders' instructions is fraught with danger," he warned.

"This kind of escalation can only vitiate the atmosphere," he said.

He said Pakistan hoped that India's latest crackdown would not jeopardise the forthcoming talks, when he said the two sides would discuss the "root cause" of the dispute.

Islamabad has long argued that the Kashmiris should determine their own future, while New Delhi says Kashmir's accession to India after Britain relinquished control of the subcontinent in 1947 is still valid.

Mr. Khan said there was no pre-arranged agenda for the upcoming talks and hoped the Indians would approach the discussions in an open manner.

"We will be ready to discuss the confidence-building measures" the Indians have suggested, he said. "But the core issue is Kashmir and redeployment of troops to peace-time locations."

Daily Urges Acquisition of Nuclear Deterrent

BK2306133290 Karachi NAWA-I-WAQT in Urdu
10 Jun 90 p 3

[Editorial: "Internal Unity, Nuclear Deterrent—Real Defense"]

[Text] According to a NEW YORK TIMES report, if Pakistan and India fail to resolve their differences over the Kashmir dispute and go to war in the coming few months, this will be the first war in history in which the two sides might resort to using nuclear weapons. The report notes that India is capable of dropping 40 to 60 atom bombs on target with the help of its 200 sophisticated aircraft. This is enough to destroy Pakistan's five major cities. Pakistan's nuclear capability is less than that of India's. Pakistan can only manufacture five to 10 atom bombs and has 40 to 50 sophisticated aircraft to deliver nuclear weapons on target.

The concern expressed by the U.S. newspaper about a future war between India and Pakistan actually reflects the apprehensions of the United States and the entire Western world. It is due to the fear of a nuclear war that Washington and Western countries are trying to help avert by all means the possibility of war. Is there be a

bigger joke than the people of the United States and Europe becoming worshippers of peace?

Anyway, it must be made clear to the world that Pakistan is a peace-loving country on which India had imposed two wars in the past. Even today, India has not only been carrying out massacres in occupied Kashmir through its armed forces, it has also moved troops out of its cantonments and deployed them on borders to intimidate Pakistan which fully reserves the right to strengthen its defense positions—a right which the United States, Europe or the free world cannot deny it.

But, Pakistan's problem is that it does not have an arms stockpile equivalent to what India has built up, making its people victims of poverty, hunger, and starvation in the process. Pakistan also cannot push back aggressor India's military force through conventional means, because when we compare only the naval strength of the two countries, we find that it is virtually impossible for Pakistan to take on India's blue water Navy. In addition to that, the Pakistani Army is performing double duty in Karachi; and if the Army also has to shoulder civilian responsibilities in the event of war the country's defense will be left only to God.

At present, Pakistan is facing both internal and external dangers and its only way out is to immediately control the domestic unrest and find ways and means to forge national unity. To achieve this objective, it is necessary to eliminate the agents of [India's] "Research and Analysis Wing" and other foreign agents and subversives who have infiltrated into the ranks of the people of major cities like Karachi, creating disturbances as and when they want.

On the other hand, Pakistan must not shy away from exercising its option of nuclear deterrence, as it has no other means of staving off a possible Indian aggression. Pakistan is a peace-loving country and it does not want to vitiate the atmosphere of peace and reconciliation now prevailing in the world, but it will never compromise its national security and independence. Since it is not possible for Pakistan to face India's challenge and meet its formidable war machines with conventional weapons and worn-out strategy, it must therefore exercise the nuclear-weapon option, so that India will not dare attack Pakistan for fear of Islamabad's retaliation.

In fact, the atom bomb can be a deterrent. The reason why world nations, especially the two superpowers, are striving for peace is that each side knows the other is not weak. Pakistan too, by acquiring the same level of capability, can succeed in keeping India from committing any mischief against it.

Deputy Foreign Minister Discusses Non-Proliferation in Middle East

PM2806104790 Moscow IZVESTIYA (Morning edition)
in Russian 26 Jun 90 p 4

[Interview with USSR Deputy Foreign Minister V.F. Petrovskiy by correspondent A. Ostalskiy; place and date not given: "Near East on the Brink. How Can a Catastrophe Be Averted?"]

[Excerpts] [passage omitted]

[Ostalskiy] What can be done, in the Soviet Union's view, to pull the Near East back from the brink?

[Petrovskiy] We are in favor of making maximum use of the UN potential to help find compromise solutions in the region. The convening of an international conference on the Near East, with the participation of all interested parties, including the PLO, and also the permanent members of the Security Council, remains the chief landmark. Possible approaches include consultations among the permanent members of the Security Council and the appointment of a special representative of the UN secretary general for the Near East, and, at a later date, the establishment of a Palestinian-Israeli dialogue. From the viewpoint of reducing the danger of war, it would be necessary to place on a practical footing the implementation of Egyptian President H. Mubarak's proposals on turning the Near East into a zone free from mass destruction weapons. One might also think about establishing a regional center to reduce the danger of war. Obviously it is high time there was a serious discussion of such matters as the nonproliferation of missiles and missile technology in the Near East and the reduction of the military potentials of the region's states to the level of reasonable sufficiency. In other words, the time has come for action; moreover, in order to prevent a dangerous exacerbation of the conflict, it is necessary not only to make maximum use of traditional methods, but to seek new ones. The Near East must not remain a blot on a political map of the world that is changing for the better. [passage omitted]

[Ostalskiy] You said that the principle of reasonable sufficiency in armaments is relevant to the Near East as well. But how does this square with the continuing large-scale supplies of Soviet weapons to the Near East? When working in Baghdad I saw for myself what it is like when extremely destructive missiles made in my own country rain down from the sky. At the same time, modified missiles of the same origin were sowing death and destruction in Tehran. At the moment the USSR is selling weapons—and plenty of them—to both Iran and Iraq....

[Petrovskiy] These supplies are indeed a reality. But they are associated with certain treaty commitments by our country. Nevertheless, we believe this question must be tackled. We have already declared our willingness to participate in an international register of armaments. The intention is that the document will be drawn up by

the United Nations and, in order to register, states will supply data on sales of their weapons abroad. The most active "sponsors" of this idea at the moment are Italy and Colombia. But many other countries, including the USSR, actively support the register. It is a pity that some other states, including the United States, are rather cool toward this project: Indeed, for this document to be effective it would have to be universal. This would make it possible to create an atmosphere of glasnost and openness around this acute problem and prevent the unimpeded formation of black markets in weapons. But it must not be forgotten that this is only the first, the smallest step toward a solution of the problem. We must aim to achieve an accord on the nonproliferation not only of nuclear weapons, but of all other types of armaments. [passage omitted]

Foreign Ministry Warns of Proliferation Danger

PM2906183790 Moscow IZVESTIYA (Morning edition)
in Russian 30 Jun 90 p 5

[TASS report: "On the Near East Situation; Statement by USSR Foreign Ministry Spokesman"]

[Excerpt] The situation taking shape in the Near East is evoking growing concern in us. In connection with the absence of positive improvements in a Near East settlement, the situation in the region is assuming a clear and negative dynamism. Peace efforts are being retarded and the influence of extremist and fundamentalist forces is growing. The arms race and the proliferation of missile, chemical, and other types of weapons of mass destruction is continuing and this carries the threat of catastrophic consequences in the event of a new explosion in this region. [passage omitted]

Nuclear Submarine Sale to India Criticized

PM0407140890 Moscow MOSCOW NEWS in English
No 26, 8-15 Jul 90 p 12

[Article by Aleksandr Mozgovoy: "Selling Nuclear Subs Abroad"]

[Text] According to The Sunday Observer, India is planning to acquire a second nuclear submarine from the Soviet Union. The first one, named "Chakra"—which means "wheel" and symbolizes the eternity of life (incidentally, Chakra is depicted in the centre of the Indian national flag)—was leased to India in 1988.

At the time this event touched off a controversy abroad (but, as usual, this was hushed up in our country). "Chakra" belongs to the subclass of nuclear submarines equipped with sea-launched cruise missiles. These missiles can also carry nuclear warheads. True, Moscow said the submarine leased by India was not armed with nuclear missiles and was meant for training purposes only.

But the expediency of such lease is doubtful. Such a transfer of nuclear technologies for military purposes to

other countries does not correspond if not to the letter, then to the spirit of the Treaty on Non-Proliferation of Nuclear Weapons, signed by the USSR. India has refused to be part of this important agreement.

The nuclear arms race in South Asia has reached a dangerous pitch. Several years ago India tested a nuclear device. Pakistan, too, has an extensive nuclear programme. Both states are hard at work developing nuclear weapon carrier missiles.

"The risk of nuclear war today is greater than ever in the last decade, but not between the superpowers," says professor G. Milhollin of the University of Wisconsin. "There is a real chance of war in South Asia for Kashmir." Maybe, this is an exaggeration. But why add nuclear fuel to the fire of Indo-Pakistani disputes?

Supplying nuclear submarines to India also runs counter to the idea of turning the Indian Ocean into a zone of peace. The arms race in its basin is escalating as it is. The

might of the Indian Navy has grown considerably. Today it is capable of operating on vast areas of the ocean. "At present the Indian Navy cannot create a threat to the navies of the superpowers in the Indian Ocean. But after ten years hence, if their number doubles, they will be capable of doing so," says Admiral J. Nadkarni, Chief of Staff of the Indian Navy. In his opinion, India, relying on its Navy, should turn into a major regional power capable of ousting an "extra-regional presence".

According to reports from India the second submarine will be sold rather than leased, lifting restrictions on its use in combat.

Perhaps from a commercial point of view, the sale of nuclear submarines is profitable. But restraint and extreme circumspection are needed in any arms deal. Particularly, if it concerns nuclear technologies. Their deliveries must be strictly banned. The USSR Supreme Soviet must raise serious objections to this.

CANADA

Pickering Nuclear Reactor Restarted After Shutdown

51200024 Toronto THE GLOBE AND MAIL
in English 7 Jun 90 p A11

[Text] The first of eight reactors at Ontario Hydro's Pickering nuclear power station was restarted this week after a month-long maintenance shutdown of the entire plant. Three more reactors are to be restarted in the next two days and all but two units are scheduled to be operating by mid-June.

Michele McMaster, a Hydro spokeswoman, said the shutdown was required for inspection and maintenance that is carried out every 10 years on the vacuum building, which is designed to contain any radioactive steam if a malfunction occurs.

She said the shutdown is scheduled for spring because that is when the demand for electricity is at its lowest, coming between the highest demand period, winter, and second-highest, summer.

The seventh Pickering unit is to be restarted on 1 September after an inspection of the pressure tubes. The eighth unit, being retubed, will be shut down until April.

A combination of factors forced Hydro to buy more power this winter from other utilities. A loss of efficiency and the need for retubing at the Bruce A Station and a delay in the startup of the new Darlington nuclear station coincided with a 35 per cent decrease in allowable acid gas emissions.

Epp Orders Inspection of Romanian Candu Complex

51200025 Toronto THE GLOBE AND MAIL
in English 7 Jun 90 p A13

[Article by Charlotte Montgomery]

[Text] An unfinished Candu nuclear reactor complex in Romania is to be examined for technical flaws as Canada decides whether to provide a multimillion-dollar loan to finish the job. Energy Minister Jake Epp agreed to order the inspection of the controversial Candu project at a meeting with two opposition party MPs who demanded an inquiry into the quality and conditions of work at the Romanian site, a spokesman for Mr. Epp said.

Eric Alexander, the minister's spokesman, said he did not know whether a decision on a loan to finish the project would be made only after the inspection. But "one can fairly assume the government would have every interest in having the results" beforehand, Mr. Alexander said.

In May, New Democratic Party MP Svend Robinson and Liberal MP David Walker visited the unfinished Candu project in Cernavoda, west of the Romanian

capital of Bucharest, in the wake of news reports of appalling housing conditions, forced labor and poor workmanship.

Canada has been helping Romania to build the project for a decade and most criticisms spring from the regime of dictator Nicolae Ceausescu, who was deposed and killed last December.

The two MPs were invited to meet Mr. Epp and External Affairs Minister Joe Clark on 31 May to share their observations and recommendations, Mr. Alexander said. A spokesman for Mr. Clark said that the meeting was private and that recommendations from the MPs were being given serious consideration.

Mr. Epp's spokesman said no decision had been made about how the review will be conducted.

Mr. Robinson said he and Mr. Walker were assured that the Romanian government's request for additional money to finish the project would be given special scrutiny and the results of the inspection will be taken into account.

Mr. Walker said Mr. Epp also indicated that a House of Commons committee will examine this fall how Crown corporations such as Atomic Energy of Canada Ltd. should deal with the sort of circumstances presented in Romania.

Donald Lawson, president of Candu operations for AECL, has said the quality of work on the project deteriorated so badly under a speedup ordered by Mr. Ceausescu last year that one-third of all welding work was unacceptable. But he said the welding work is back to proper standards now and the project's construction is sound.

Ontario Hydro Concerned at Aging Reactor Efficiency

51200023A Toronto THE GLOBE AND MAIL
in English 5 Jun 90 pp A1, A2

[Article by Rudy Platiel: "Aging Reactors Not as Efficient as Expected, Ontario Hydro Says"]

[Text] A drop in the operating efficiency of Ontario Hydro's Candu reactors is costing the utility money and causing concern.

Alan Holt, Hydro's vice-president of corporate planning, told a nuclear conference yesterday that last year Hydro's reactors achieved only a 72 per cent operating efficiency, compared to 90 per cent in 1981.

Ontario's "A reactors"—those older than 10 years—generated only 57 per cent of the power they were designed to produce last year, making the power barely 2 per cent cheaper than what would be generated by coal- or oil-burning plants.

As well, efficiency of all units measured since they were put in service was 77 per cent, "significantly below our target of 80 per cent," Mr. Holt told the Canadian Nuclear Association's annual conference.

Increasingly, Hydro has had to shut down its older reactors for repairs as parts wear out before they are expected to do so.

The shortfall in the efficiency level of these older models forced Ontario to purchase \$200-million in replacement power from other utilities during the first six months of this year.

However, Mr. Holt said the human health safety record remains unblemished and the newer "B reactors" are maintaining a 90 per cent efficiency.

Long-term reliability is a concern, he said, because Ontario has no major alternative to nuclear power.

In water power, most of the province's big economically viable sites are developed and environmental concerns limit coal-fired generation.

For example, he said, to replace just a 2 per cent drop in nuclear power in 1995 with coal-fired generation would be "pretty well impossible" under current emission standards.

In the future, utilities outside Ontario are less likely to have extra power available for sale, he said in an interview, and a long-term purchase of power from Hydro Quebec's James Bay project—now being sold to U.S. utilities—would cost Ontario almost twice what it is paying for power from its own Candu reactors.

"If we pay that sort of price for energy from outside the province the impact on our rates is such that it could start influencing the economics of industry here," he said.

"I'm not critical of Quebec. It's their energy source and they are entitled to get what they can for it. But right now the U.S. market is prepared to pay more than we can really afford."

Mr. Holt said "it's imperative" that Hydro get top performance from its B stations during the next decade.

"We can't allow them to deteriorate as quickly as their predecessors. In just 12 years from now, about one quarter of our nuclear capacity will be more than 25 years old" and by 2014, half will be in that category, he said.

FEDERAL REPUBLIC OF GERMANY

Involvement in Iraqi Gun Factory Reported

AU1007114190 Hamburg DER SPIEGEL in German
9 Jul 90 pp 54-56

[Text] The small model looked quite harmless. One could see miniature furnaces, cranes, and presses—

everything that is needed at a smith's workshop. One would assume that it would only appeal to persons with special interests.

However, there seemed to be a considerable number of such persons at the industrial fair in Baghdad. With great pride, Iraqi government representatives repeatedly showed visitors the miniature factory.

Not far from Baghdad, near the village of Taji, the real smithy can be visited now. The factory is nearing completion, and not just experts are interested in the plant.

The U.S. intelligence agency, the CIA, and the Israeli intelligence service, Mossad, are now investigating the factory. German public prosecutors and customs investigators have also been dealing with the plant in Iraq during the past few weeks.

The Essen-based subsidiary of the MAN company, Ferrostaal, and a dozen leading German steel, construction, and engineering companies were involved in the construction of the plant, where the manufacture of a product urgently required by dictator Saddam Husayn will shortly begin: The manufacture of guns.

Confiscated files reveal that about 1,000 medium and heavy artillery pieces are to be produced in Taji even during the initial phase. Experts fear that even the legendary 156-meter supergun—a mammoth mortar with a range of over 1,000 km, which the Husayn regime has been trying to build for several years—might one day be produced in Taji.

The Washington and Bonn governments are concerned. After the delivery of a poison gas plant to al-Rabitah in Libya, which was organized by the FRG entrepreneur Hippenstiel-Imhausen, together with the formerly state-owned Salzgitter AG company, a new serious weapons scandal seems to be emerging, in which leading West German industrial firms are again involved, including the MAN engineering concern, the Essen-based construction company Hochtief, the Duisburg-based Klockner company, and the renowned Mannesmann company in Duesseldorf.

Recent investigations by the public prosecutors in Bochum have confirmed what has been evident since the al-Rabitah affair (DER SPIEGEL 27/1990): The exporting craze of the large FRG industrial enterprises does not stop at murderous deals. German weapons and weapons plants are in high demand all over the world because of their precision. And the Germans seldom reject such deals.

The gun production plant in Taji is one of the most ambitious projects in the military empire of dictator Saddam Husayn. His demand for artillery pieces is enormous. In the war against Iran, not only were hundreds of thousands of people killed, but most of the guns have become unusable as well.

According to the findings of the investigators, a small company in Monza in Italy had been given the order to

ensure supply from Europe. The enterprise, whose involvement was discovered when material was confiscated, is well known to those who are familiar with weapons deals: European Manufacturer Center (Euromac) is the harmless name of a company that has a branch in Frankfurt as well.

Two Euromac employees were arrested in London in March this year. They are suspected of having helped procure 40 special igniters for nuclear weapons. The two employees were caught at Heathrow Airport when they tried to smuggle the igniters to Baghdad.

Euromac, which is headed by two Iraqi brothers, Kassem and Abbas Husayn, were apparently active all over Europe in organizing the construction of the gun factory. A number of syndicates tried to obtain the order for the "universal smithy." The French group headed by the Sofresid engineering company and the Compagnie Francaise de Forges and Fonderies (C3F) metallurgical works wanted to supply the know-how for the factory and participate in the construction.

However, the French syndicate was unlucky. The French Government became suspicious. It did not really believe the story of the smithy that was allegedly to produce material needed for drill rods and seamless oil pipes. Thus, the deal did not come about.

The West Germans had no such scruples. Ferrostaal won the order. The Essen-based company had submitted the most favorable order, which involved 130 million German marks [DM]. At the beginning of 1989, the smithy was supplied to Iraq by ship. Special wishes were taken into consideration. The Iraqis were mainly interested in artillery pieces that were based on the know-how of the Duesseldorf gun-producing company Rheinmetall. Husayn's military officials wanted to fire unerring shots with guns similar to Rheinmetall guns, possibly with calibers of between 105 and 203 millimeters.

This was no problem for the main contractor from Essen. According to the findings of the investigators, Rheinmetall also received an order.

For every important part of the Taji project, a specialist was hired. The Essen-based Hochtief construction company built the unusually stable foundations. The subsidiary of the Feldmuehle company, Buderus, which is a renowned manufacturer of casting equipment, supplied expert knowledge.

The Ferrostaal enterprise, the MAN subsidiary which specializes in building plants, procured orders for several companies belonging to the MAN concern. The Duesseldorf-based MAN company Hasenclever supplied a melting press for iron pieces weighing up to 30 tonnes. A MAN enterprise in Nuremberg delivered a 50-tonne crane to Iraq.

Smaller firms received orders as well. The Siegen-based Dango and Dienenthal engineering works manufactured special equipment for the treatment of melted masses.

Investigations by the Bochum public prosecutor and by the customs authorities in Duesseldorf concentrate mainly on the main contractor Ferrostaal. Public prosecutors have initiated investigations against "responsible persons of the Ferrostaal concern" because they are suspected of having violated the foreign trade law.

Most of the FRG subcontractors have so far pretended not to know anything. They told investigators that Ferrostaal had assured them of the unobjectionability of the deal.

The material that has been confiscated is so extensive that the Essen Public Prosecutor's Office, which is responsible for the case, passed it on to the Bochum Public Prosecutor's Office after a few days. Initial investigations have revealed that it will not be possible for Ferrostaal to get out of this situation by pretending not to know anything about the real purpose of the project.

The public prosecutors discovered hints in the files that suggest that the Ferrostaal managers knew about the real purpose of the "universal smithy." However, the investigators do not know who produces the machines and parts for the production of projectiles. It is also unclear who is supplying the technology or the know-how for the drilling of the up to 10-meter-long gun barrels.

All preparatory work to produce the weapons is carried out in Taji. A rolling mill is currently being built under the leadership of Danieli, an Italian concern. The steel manufacturing plant, which is located next to the smithy and which is to produce the required material, is being built by the Kloeckner concern in Duisburg.

The steel manufacturing plant alone costs DM180 million. Kloeckner formed a syndicate to complete the project. The casting molds and the machinery for the steel works was supplied by the Swiss engineering company Georg Fischer. The Stuttgart Zueblin construction company carried out construction work, and the Mannheim ABB company supplied electric equipment and the furnaces. The Demag-Huettentechnik company delivered casting equipment.

All the companies were involved, but claim not to know in what project. Mannesmann has not supplied anything to Iraq, a company spokesman pointed out. Later he admitted that equipment for the project was sent directly to Kloeckner.

Managers in the weapons industry talk about their deals with false naivete and with a twinkle in their eyes. Companies who were involved in the construction of a poison gas plant for the Libyan ruler Mu'amar al-Qadhafi pretended that they were supplying equipment for a pharmaceutical plant in Hong Kong. This time a "universal smithy" is allegedly being built.

One can, of course, manufacture all kinds of forgings at such a plant, Ferrostaal head Hans Singer stressed. It is not the task of the supplier to find out what happens with the forging blanks.

"It should not be surprising for an expert that they can be turned into other things," Singer pointed out. "We have a clean conscience," he added.

A company spokesman has made the following comparison: "In the same way, a company that supplied school buses could be later accused that the buses are used for transporting soldiers."

Services by the FRG industry for the Iraqi warriors have a tradition. In December 1989, it became known that German specialists were supplying technical support for the construction of a nuclear weapon in Iraq.

Public prosecutors are currently investigating the activities of the Bielefeld Gildemeister Projecta GmbH company. In its capacity as main contractor, the Bielefeld company won a number of renowned FRG enterprises for the construction of a militarily protected research plant—allegedly Mosul University. However, Saad 16 is actually a weapons research center which is partly housed in a bunker, and in which the Iraqis are carrying out research concerning chemical weapons, missiles, and other weapons.

According to Western intelligence services, German firms were even involved in the production of chemical weapons that Husayn used against Iranian soldiers and Kurds in the Gulf war. The Darmstadt public prosecutor has for years been trying to clarify the scandal.

The ruler in Baghdad, who wants to turn his country into the leading military power in the Arab world, is under time pressure. The import of weapons is becoming increasingly difficult. Most of the control authorities in the West become alert when they hear the word Iraq.

Only with the FRG does cooperation continue to be good. In a nearly unmolested manner, the small H and H Metalform company in Drensteinfurt succeeded for years in conducting explosives business with bellicose Husayn.

The two owners of the company, Peter Huetten and Dietrich Hinze supplied machines to Baghdad by means of which gas ultracentrifuges can be produced. A 90-percent enrichment of uranium 235 is possible in such plants. This is the substance needed for the production of nuclear weapons.

During the final years of the Gulf war, Iraq purchased mainly missile bodies from the H and H company. The demand was enormous. In a single night at the end of 1987, the Iraqi Army fired 6,000 missiles at the enemy.

The Drensteinfurt company even offered the production of drop tanks. With the help of such drop tanks, chemical weapons can be dropped from airplanes.

Former employees of the small company want to tell the whole truth as witnesses. However, H and H owners Hinze and Huetten remained unmolested with the exception of a DM2,000 fine because of illegal deals with Brazil.

Not far from the seat of the H and H company is the town of Ahlen. Hinze and Huetten also worked for the Ahlen-based Leifeld and Company (Leico) engineering works until a few years ago. Now the deals with the Iraq are running smoothly there.

On 5 October 1989, representatives of the state-owned NASSR Enterprise for Mechanical Industries paid a visit to Leico. The Iraqis carried construction drawings in their briefcases to build high-capacity driving nozzles for missiles.

Years ago German engineers had successfully participated in the first missile project Al-Husayn (range of 670 km) and in the successor model Condor (900 km). Now Leico should once more supply parts for Iraqi missiles.

As early as one day after the visit from Baghdad, Leico managers had construction drawings distributed in the research and development department. The technicians set to work and developed a high capacity and extremely stable driving nozzle.

The deal the Leico company managers made—the company belongs to the Munich-based Matuschka group—was discovered. About three weeks ago, customs investigators started investigations. As recently as one week ago, the Federal Office for Economy in Eschen stopped the supply of Leico parts to Iraq.

The officials discovered that the construction drawings submitted together with the application for the export permit were not identical with the exported parts.

The order for Leico was apparently also designed to advance the construction of the giant gun with which is currently a cause of concern in the Middle East. It would be possible for Husayn to hit both arch enemies Iran and Israel with such a miracle weapon. The project is known as the "Babylon" project.

Investigators all over the world are currently discovering traces of the "Babylon" project—particularly in Germany.

At the end of April, customs officers at Frankfurt Airport prevented the export of 17 cases destined for Baghdad. Experts discovered that the machine parts were compatible with the precision steel pipes for the giant gun (one meter diameter) which were recently seized in London.

However, so far only some of the senders have been traced. Some cases carried the inscription "Mannesmann"—which was allegedly a mistake. The hydraulic pumps were in no case destined for Iraq, a Mannesmann manager stressed shortly afterward.

Husayn must not only deal with setbacks of that kind. His most important aide, the native Canadian Gerald Bull, was apparently killed by intelligence agents in Brussels in March. The ballistics expert had for decades worked on the giant gun with his Spall Research Corporation.

Husayn will get over the loss of the Canadian. He can rely on the Germans.

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DATE FILMED

14 Aug. 1990